



EVALUATION OF THE TREATMENT OF FRACTURES OF THE PROXIMAL HUMERUS

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Abstract

BACKGROUND: Fractures of the proximal humerus pose a public health problem.

OBJECTIVES: The objective was to evaluate the results of different methods of treatment of proximal humerus fractures

PATIENTS AND METHODS

A prospective, single-center study, from January 2018 to December 2020, involving 14 patients received for proximal humerus fractures, treated, followed and evaluated.

The treatment was orthopedic and surgical. After a six-month follow-up, our patients were evaluated according to the Constant-Murley score.

RESULTS

We collected 14 patients including 12 men (85.71%) and 2 women (14.29%), with a sex ratio of 6. The average age was 46.5 years with the extremes of 18 years and 85 years. The circumstances of occurrence were dominated by road traffic accidents with 10 cases (71.43%). All our patients were right-handed and we found 8 cases of left-sided involvement (57.14%). Subtuberosity fractures were the most encountered with 8 cases (57.14%). We carried out 7 cases (50%) of orthopedic treatment: 6 cases by Mayo-clinic and one case by Dujarier. Surgical treatment was carried out in 7 patients (50%): 4 cases by pinning and 2 cases by screwed plate and one case by staple. We recorded 5 cases of shoulder stiffness (35.71%). At six months follow-up, our results were excellent and good in 12 cases (85.71%).

CONCLUSION

Fractures of the proximal humerus are increasing and treatment depends on the schools. The complication to fear is shoulder stiffness.

Keywords: fractures; Humerus; proximal; racking; deltopectoral

Introduction

Fractures of the proximal end of the humerus account for around 4% of all fractures [1] and around 5% of fractures in the elderly [2], [3], [4], [5]. Of these, 5% are 3-4 fragment displaced fractures according to Neer's classification [6]. They most often occur on porotic bone, and mainly affect elderly subjects [7]. They preferentially affect elderly women [8]. It is the third most common fracture over the age of 65, after fractures of the distal radius and proximal femur [9].

It is accepted that two-part fractures with little or no displacement can be treated orthopedically, with satisfactory radiographic and functional results [10], [11]. Conversely, complex three- or four-part fractures with large displacements, or dislocation fractures, require surgical treatment. Many techniques have been described, with different types of osteosynthesis (centromedullary nailing, screw-plate, fasciculated pinning, simple osteosuture, etc.), all of which have overlapping indications. Fractures that interrupt the vascular supply to the humeral head may justify prosthetic replacement [12]. At present, there is no consensus on the therapeutic management of such fractures [13], [14], which range from simple immobilization to humeral arthroplasty via several osteosynthesis techniques.

The aim of our work was to evaluate the results of the different methods of treating proximal humeral fractures.



Patients And Methods

We produced this study at the Orthopedics-Traumatology Department of the Donka University Hospital, Conakry - Republic of Guinea. It was a prospective, descriptive monocentric study running from January 2018 to December 2020. Our inclusion criteria were 14 patients received for fractures of the proximal end of the humerus, treated, followed and evaluated in the Orthopedics-Traumatology Department. All patients received for fractures of the proximal end of the humerus who had not been managed and evaluated were excluded, as were children under 18 years of age whose conjugation cartilage had not yet closed. Our study variables were epidemiological, therapeutic and evolutionary.

Clinically, our patients showed functional impotence with the attitude of upper-limb trauma, swelling and shoulder pain, with varying degrees of brachio-thoracic ecchymosis. We performed standard radiography in all our patients, and bone lesions were classified according to Neer's classification. Half of our patients were treated orthopedically, with reduction by external maneuver and Mayo-clinic or Dujarier restraint, for fractures with little or no displacement; the other half underwent open-focus surgical treatment with reduction and osteosynthesis either by Kapandji or Hackethal-type pinning, or by screw plate or staple, supplemented by immobilization of the limb with Mayo-clinic, the indications for which were justified by three- or four-part fractures, displaced and/or associated with glenohumeral dislocation. All patients underwent general anaesthesia, and were positioned supine on an ordinary table, with a cushion under the shoulder to be operated on. The approach was deltopectoral in patients who had undergone reduction and screw-plate osteosynthesis, and transdeltoid in patients who had undergone pinning and stapling. After a satisfactory follow-up radiograph, our patients underwent early rehabilitation with gentle, passive mobilization of the limb and isometric contraction of the deltoid.

After a six-month follow-up, our patients were evaluated according to the Constant-Murley score. Our data sources were hospitalization and consultation registers, operative report registers and patients' medical records. Our results were entered using Word software and analyzed using Epi info version 7.2. Our limitations and difficulties were the poor quality of some radiographic images, which were unusable, and patients who were lost to follow-up.

Table 1: Constant-Murley functional assessment score [15].

Douleur (total sur 15 points)	A. Echelle verbale 0 = intolérable 5 = moyenne 10 = modérée 15 = aucune				
	B. Echelle algométrique Soustraire le chiffre obtenu du nombre 15		15		
	0 = Absence de douleur		douleur sévère		
Niveau d'activités quotidiennes (total sur 10 points)	Activités professionnelles/ occupationnelles	Total		A + B / 2 (15)	
		travail impossible ou non repris	0 point		
	Activités de loisirs	gêne importante	1 point		
		gêne moyenne	2 points		
Gêne dans le sommeil exemple : aux changements de position	gêne modérée	3 points			
	aucune gêne	4 points			
Niveau de travail avec la main (total sur 10 points)	A quelle hauteur le patient peut-il utiliser sa main sans douleur et avec une force suffisante ?	impossible	0 point ;		
		gêne importante	1 point ;		
Mobilité (total sur 40 points)	Antépulsion (total / 10)	gêne moyenne	2 points		
		douleurs insomniantes	0 point		
	Abduction (total / 10)	gêne modérée	1 point		
		aucune gêne	2 points		
	Rotation latérale (total / 10)	taille	2 points ;		
		xiphoïde	4 points ;		
	Rotation médiale (total / 10)	cou	6 points		
		tête	8 points		
	Force musculaire (total sur 25 points)	Abduction isométrique (élévation antéro-latérale de 90° dans le plan de l'omoplate)	au dessus de la tête	10 points	
			si 90° n'est pas atteint en actif si maintien de 5 s, par 500g	0 point	
Total (total sur 100 points)	Valeur absolue (en points/100)				
	Valeur pondérée (%)				

Interpretation: 0 - 55 points = Poor; 56 - 70 points = Mediocre; 71 - 85 points = Good; 86 - 100 points = Excellent.

Results

We enrolled 14 patients, 12 men (85.71%) and 2 women (14.29%), with a sex ratio of 6. The mean age was 46.5 years, with extremes of 18 and 85 years. The age group most affected was between 29 and 38. The circumstances of onset were dominated by road traffic accidents with 10 cases (71.43%), 3 cases of falls and one case of assault with a firearm. The mechanism was direct in all our patients. All our patients were right-



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handed, and we found 8 cases of left-sided involvement (57.14%) and 6 cases of right-sided involvement (42.86%). Subtuberosity fractures (surgical neck) were the most common, with 8 cases (57.14%). Fractures were closed in 13 of our patients (92.86%). Associated lesions were dominated by homolateral glenohumeral dislocation, with 4 cases (28.57%). Management time was less than twenty-four hours in 7 cases (50%), between the twenty-fourth and seventy-twelfth hours in 6 cases (42.85%) and more than seventy-two hours in one case. We carried out orthopaedic treatment in 7 cases (50%), including 6 cases with Mayo-clinic reduction and compression, and one case with Dujarier. Surgical treatment was carried out in 7 patients (50%), including 4 cases of pinning, 2 cases of screw-plate and one case of stapling.

Table 2 : Distribution of patients according to surgical treatment

Surgical treatment	Effective	Percentage (%)
Racking (Kapandji)	2	28.57
Racking (Hackethal)	2	28.57
Screwed plate	2	28.57
Staple	1	14.29



Figure 1: Fracture-dislocation of the proximal humerus treated with a screwed plate

We recorded 5 cases (35.71%) of shoulder stiffness, in whom we carried out physiotherapy sessions. One case of malunion, 2 cases of omarthrosis.

After a six-month follow-up, our results were excellent in 8 cases, good in 4, mediocre in one and poor in one.

Table 3 : Distribution of patients according to functional outcome assessment

Scores	Effective	Percentage (%)
Excellent	8	57,15
Good	4	28.57
Poor	1	7.14
Bad	1	7.14

DISCUSSION

Fractures of the proximal end of the humerus account for 85.71% of fractures in males, with a predominance of the 29 to 38 age group in our series, and a high frequency of direct mechanism by direct fall onto the shoulder in road traffic accidents.

According to the literature, fractures of the proximal end of the humerus occur increasingly in elderly female subjects on a porotic bone [1], [2], [3], and come in third place behind fractures of the distal radius and proximal femur [7].

The frequency with which young males are affected in our series can be explained by the use of two-wheelers as a means of transport by young people, resulting in high-energy trauma.

The management of these fractures is not unequivocal, and there is no consensus on the therapeutic method or osteosynthesis technique. We performed seven (7) cases of orthopedic treatment, six (6) of which were performed by Mayo-clinic and one by Dujarier. The other seven cases were treated surgically using different operative techniques, with almost identical results. We performed a mini-incision to obtain an anatomical



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reduction and control the passage of Kirschner wires opposite the fracture site in fractures treated by pinning, due to the lack of an image intensifier in the department.

At the six-month follow-up, our patients were assessed according to the Constant-Murley score, and our results were excellent and good in 85.72% of cases. This was due not only to the early rehabilitation started the day after surgery, but also to the introduction of physiotherapy sessions in all patients treated orthopedically with Mayo-clinic and Dujarier after removal of the immobilization.

Conclusion

The incidence of fractures of the proximal end of the humerus is increasing in both young and elderly patients, and treatment depends on age, bone quality and type of injury. The complication to be feared is stiffness of the shoulder, hence the need for early and effective rehabilitation.

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Tables

1. Constant-Murley functional assessment score [15].

2. Distribution of patients according to surgical treatment

3. Distribution of patients according to functional outcome assessment