



## Case Report

# Fractures of the Radial Head: Epidemiological, Lesional, Therapeutic and Evolutionary Aspects at the Sylvanus Olympio University Hospital in Lomé (Togo)

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### Abstract

**Background:** Radial head fractures account for about one-third of elbow fractures. They are serious because they can cause stiffness in the elbow. The aim of this study was to review the management of these fractures and to assess the outcome of surgical treatment.

**Materials and methods:** This is a retrospective study of 19 patients treated for radial head fracture from January 2012 to December 2019 at the Sylvanus Olympio University Hospital in Lomé.

**Results:** Radial head fractures accounted for 29.3% of elbow fractures and 2.7% of upper limb fractures. The mean age of the patients was 38 years and the sex ratio was 2.8 in favor of men. Road accidents were involved in 68%. In terms of lesions, type IV was the most represented in 42.10% of cases according to the Mason classification modified by Morrey. Elbow dislocation predominated among the associated lesions. Treatment was surgical in 68.42% of cases (n=19), and radial head resection was performed in 84.62% of cases (n=13). After a mean follow-up of 28 months, stiffness of the elbow was found in 30.76% of cases. According to the MEPS score, the results were excellent in 8%, good in 46%, average in 31% and bad in 15% of cases.

**Conclusion:** The management of this lesion remains a challenge in our context, however resection remains the treatment of choice for complex fractures of the radial head.

**Keywords:** Elbow; Osteosynthesis; Radial head fracture; Resection; Togo

### Introduction

The fracture of the radial head is defined as being a solution of continuity whose line lies on part or all of the radial cup [1]. Radial head represents the second stabilizer of the elbow in valgus and in external rotation after the medial collateral ligament [2]. It is involved in joint mobility of the elbow in flexion-extension and in prono-supination [3]. Radial head fractures are the most common among elbow fractures [4]. They account for 30 to 33% of elbow fractures, and occupy between 1,5 and 5% of all human skeletal fractures [3,5]. They are serious because they occur in a

young working population and can cause instability in valgus, but especially stiffness of the elbow. We undertook this study in order to determine the epidemiological profile of the patients and to describe the lesional, therapeutic and progressive aspects of these fractures in Togo.

### Materials and Methods

This is a retrospective study, carried out at the Sylvanus Olympio teaching hospital of Lomé over a period of eight years, from January 2012 to December 2019. Our study concerned 19 patients over the age of 15, treated during the study period for radial head fracture, and whose records were well informed. Patients with incomplete records were excluded. We first carried

out an analysis of the patient files, the data was collected on a survey sheet. In a second step, the patients who were operated were seen again for a radiological and functional evaluation of the elbow and the wrist. The parameters studied were age, sexe, circumstances of occurrence, clinical and radiological data before treatment, time to treatment and type of treatment administered, as well as clinical and radiological progress data. We used the modified Mason classification Morrey [6] to list bone lesions. The post-operative functional assessment was performed using the Mayo Elbow performance Score (MEPS) [7] after a mean follow-up of 28 months.

**Results**

Among 438 patients hospitalized for upper limb trauma during our study period, radial head fractures accounted for 29.3% of elbow fractures and 2.7% of upper limb fractures. Of the 19 cases in our series the average age of the patients was 38 years with extremes of 20 and 64 years. The male sex predominated with 73.7% of cases, the sex ratio was 2.8. Road accidents were the main etiology in 68% of cases.

In terms of lesions, type IV was the most frequent with

42.1% of cases, followed by type III with 26.3% of cases (Table 1). Elbow dislocation was the most common associated injury.

	Number	Frequency
Type I	3	15,80%
Type II	3	15,80%
Type III	5	26,30%
Type IV	8	42,10%
Total	19	100%

**Table 1:** Distribution of fractures according to the modified Mason classification Morrey.

Orthopedic treatment was administered in six cases, and surgical treatment in 13 other cases. Among the surgical techniques, resection of the radial head associated with annular ligament plasty was the most performed (Table 2). Cadenat’s posterolateral approach was used in 11 cases, and the pure lateral approach was used in both cases of internal fixation. The average time before management was eight days with extremes of two and 15 days.

Type of fracture	Type of surgical treatment (Number)	
	Osteosynthesis	Resection
II	1	-
III	-	5
IV	Simple non-displaced fracture	-
	Displaced simple fracture	1
	Comminuted fracture	-

**Table 2:** Summary of surgical treatment according to the type of fracture.

The surgical treatment was evaluated after a mean follow-up of 28 months. In five patients, the functional signs were marked by elbow pain less than or equal to 3 on the visual analogue scale. In one patient, pain was rated at 5 in the elbow and wrist. The mean elbow flexion was 135.3 °, the mean extension was -8.2 °, the mean pronation was 74.6 °, and the mean supination was 82.7 °. Elbow stiffness was identified in four patients, and in one patient there was an ulna valgus. Radiologically, there was an ascension of the radius in one patient, associated with an inversion of the distal radioulnar index. Undeveloped osteoarthritis was found in the elbow in two patients. The functional results are collated in Table 3.

	Type of fracture	Treatment	Functional result
Patient 1	IV	Resection	Bad
Patient 2	III	Resection	Good
Patient 3	IV	Resection	Good
Patient 4	III	Resection	Average
Patient 5	IV	Resection	Good

Patient 6	IV	Screw fixation	Good
Patient 7	III	Resection	Bad
Patient 8	II	Screw fixation	Excellent
Patient 9	IV	Resection	Good
Patient 10	III	Resection	Average
Patient 11	III	Resection	Average
Patient 12	IV	Resection	Good
Patient 13	IV	Resection	Average

**Table 3:** Functional result of surgical treatment.

## Discussion

Fractures of the radial head are rare but more common in young adults. Their functional impact on the elbow is important because stiffness remains the main complication. Few studies in Africa have looked at elbow injuries. These fractures represent 29.3% of upper limb fractures in Togo. According to the literature, radial head fractures account for 30 to 33% of elbow fractures and occupy between 1.5 and 5% of all fractures in the human body [3,5,8]. The young adult was the most affected in our study. This predominance of young adults is consistent with data from the literature. For Badoui et al. in Morocco, the average age was 32 years [9]. For Zarifian et al. in Iran, the mean age was  $36.25 \pm 9.22$  years [10]. This predominance is explained by the fact that young people constitute the most active social layer but also the one who uses two-wheeled vehicles which are frequently involved in road accidents in our country. The male predominance, also consistent with the data in the literature, can be explained by the recklessness of men but also by the exercise of certain professions such as manual work. Kass et al. reported a sex ratio of 2.3 in favor of men [11]. Road accidents were the main etiology of radial head fractures in our series, as reported by Ascencio et al, and Badaoui et al. [9,12]. This high frequency of accidents on public roads is linked to the increase in the vehicle fleet and particularly two-wheeled vehicles. In terms of injury, types IV and III were the most common in our study, unlike most authors, as shown in Table 4.

	Number of cases	Type I	Type II	Type III	Type IV
Badaoui R. et al. [7]	25	4%	56%	24%	16%
Kaas et al. [9]	147	50.30%	36.10%	8.80%	4.80%
Nietschke et al.[5]	35	57,14%	22,85%	14,30%	5,71%
Our series	19	15,80%	15,80%	26,30%	42,10%

**Table 4:** Comparison of the frequency of types of anatomopathological lesions according to the authors.

This high frequency of types IV and III is due to the violence of the trauma in our context. From a therapeutic standpoint, the goal of treatment is to restore the patient to a mobile, stable and painless joint. Treatment depends on the type of fracture. Type I treatment is non-operative and type II requires open fixation. For type III, on the other hand, some authors recommend resection of the radial head, others imperatively combine this resection with arthroplasty in order to restore the anatomy and stability of the elbow. Treatment of type IV depends on the nature of the fracture line of the radial head [4,6,13,14]. Whatever the treatment, mobilization of the elbow must be early. In our series, orthopedic treatment had a high rate unlike Boufetall et al. who reported 15.38% orthopedic treatment [15]. Of the 13 patients who received surgical treatment,

radial head resection was performed in 11 cases due to the type of fracture, but no joint replacements were associated. This is due to the absence and high cost of prosthetic implants in our country. Concerning the evolution, the rate of elbow stiffness was high in our case. Kusnezov et al. reported 12.70% post-traumatic stiffness in their series, of which nine out of 10 cases occurred in patients who had undergone an open reduction osteosynthesis technique [16]. We noted one case of radius ascension after head resection, due to an association with Essex Lopresti syndrome which was not diagnosed at entry. For the 10 other cases of radial head resection, annular ligament plasty, recommended by several authors [1], would have prevented this ascent. Functionally, we obtained 45.5% good results. The high percentage of average and poor

results is explained by the delay in treatment, but also by functional rehabilitation, which is very limited in our patients. We compared our results of radial head resection with the data from the literature in Table 5:

	Numbers	Results (percentage)				follow-up
		Excellent	Good	Average	Bad	
López et al. [17]	11	54,54	27,27	18,19	-	60,30 month
Singh et al. [18]	15	46,66	46,66	-	6,68	18 month
Our series	11	-	45,46	36,36	18,18	28 month

**Table 5:** Comparison of the functional results of radial head resection with data from the literature.

## Conclusion

Fractures of the radial head are relatively frequent in young adults and mainly due to road accidents. Their management is a challenge in our context where financial difficulties delay and limit adequate treatment. Resection of the radial head without prosthetic replacement is still relevant and is showing encouraging results. These results can be improved by urgent treatment and early and prolonged rehabilitation, also by the availability of radial head prosthesis.

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