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Epidemiological, clinical and therapeutic characteristics of acetabular fracture in a country with a low economic level

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Abstract

Introduction: Acetabular fractures are rare lesions and quite often problems of therapeutic management. We have few studies in African literature. The aim of this work is to describe the main epidemiological, diagnostic, therapeutic characteristics of acetabular fractures in our country.

Patients and Method: The authors report an experience of 5 years, through a retrospective descriptive mono-centric study of 41 files of acetabular fracture. Incomplete files, without imagery, patients not initially treated in the department and those lost to follow-up were not included in the study. We analyzed the following parameters: epidemiological, clinical-radiological, and therapeutic.

Results and Discussion: The series included 32 men, 9 women with an average age of 38 years and 72% was of low socio-economic level. The most common etiology was 70.7% (29 cases). Fractures were dominated by posterior wall fractures with 36.6% of cases (15 cases). Associated lesions were dominated by hip dislocations and limb fractures in 56.1% (23) and 41.5% (17) of the cases, respectively. Management was orthopedic in 56.1% of cases and surgical in 45.9% of cases. Complications are dominated by joint stiffness, vicious callus, and post-traumatic hip osteoarthritis respectively in 46.3% (19 cases) 51.2% (21 cases) and 60.1% (25 cases). The average PMA score was pair (12.5 points).

Conclusion: Acetabular fractures are the preserve of young men. The functional prognosis remains but highly dependent on the therapeutic method.

Keywords: Acétabulum, fracture, prognosis

Introduction

Fractures of the acetabulum are the consequence of a violent trauma sometimes occurring in the context of polytrauma. Their frequency is clearly increasing with the increase in road traffic and the ever-increasing number of high-speed vehicles. The incidence is quite varied according to the series 14-22%^[1-2].

These are serious injuries (joint fractures) that affect the functional prognosis of the hip. Acetabular fractures have benefited from many advances, both diagnostic and therapeutic. Surgery is the best indication for unstable or displaced fractures^[3-4].

Despite this progress, the management of this lesion remains difficult in our working context. Unfortunately, the therapeutic indications are modulated according to the patient's financial means. We have only a few studies in the African literature on this subject. This study was undertaken in order to describe the main epidemiological, diagnostic and therapeutic characteristics of acetabular fractures in our department.

Method

This is a retrospective mono-centric study carried out in the orthopaedics-traumatology department of the Cocody University Hospital in Abidjan-cote d'ivoire. It concerned all cases of acetabular fractures admitted and treated in the service from 1 January 2012 to 31 December 2016. The study didn't include patients without imaging, patients not initially treated in the department and patients who have been lost to follow-up. We analyzed the following parameters: sociodemographic, etiological, anatomo-pathological, therapeutic and evolutionary parameters.

At least 2 years later, a functional evaluation was performed according to the Postel Merle d'Aubigné (PMA) [5] functional score. Data were collected using a pre-established survey form. The data collected were processed and analyzed using SPSS 22.0 software. The analysis was descriptive and consisted of calculating numbers and determining averages and proportions. Quantitative variables were analyzed as averages. Qualitative variables were expressed in numbers and percentages.

Results

From January 2012 to December 2016, among 1836 patients hospitalized in the department, 123 had a pelvic fracture, an incidence of 6.7%.

Only 41 cases meeting our inclusion criteria were collected, representing 2.2% of hospitalizations. The annual hospital prevalence of acetabular fractures was 8.2 per year. The mean age of the patients was 38 years with extremes of 26 and 59 years and a modal class of 30-40 years. Table 1 shows the distribution by age group.

Table 1: Distribution of patients according to ange range

Age range	staff	%
[20-30[07	17
[30-40[18	43,9
[40-50[11	26,8
[50-60[05	12,2
Total	41	100

Our series consisted of 32 men and 9 women with a sex ratio of 3.5 in favour of men. The socio-economic level of the patients was low in 72% of the cases, modest in 16% of the cases and high in 12% of the cases. There were 70.7% (29 cases) of traffic accidents of which 62% (18 cases) were passengers in a vehicle and 38% (11 cases) motorcyclists.

Accidents at work were found in 29.3% (12 cases) of which 75% (9 cases) were due to falling from scaffolding and 25% (3 cases) due to a fall from a wall.

We counted 29.2% (12 cases) of polytrauma with an average Injury Severity Score (ISS) [6] of 18.16 points with extremes from 13 to 49.

Immediate complications were noted: involvement of the sciatic nerve in 03 cases (7.3%); 09 cases (21.9%) of genitourinary lesions (urethral involvement) and 04 cases (9.7%) of Morel-Lavallée syndrome.

Only 54.5% of patients were able to meet the CT scan request (Figure 1).



Fig 1: CT with reconstruction showing two-column fracture

Table 2 shows the distribution of lesions according to the Judet-Létournel classification [7].

Elementary lesions were observed in 65.85% (27) of cases. Fracture of the posterior wall was the most frequent with 36.6% (15 cases).

Acetabular fractures were associated with other lesions in

73.1% (31) of cases. Table 3 summarizes the distribution of associated lesions. They were dominated by hip dislocations and limb fractures in 56.1% (23) and 41.5% (17) of cases respectively.

Orthopaedic treatment was performed in 23 patients (56.1%) with an average duration of cast immobilization of 9 weeks with extremes of 8 to 14 weeks.

In twelve patients (29.3%) internal osteosynthesis was performed (03 isolated screwing; 9 screwed plates). In 04 patients (9.7%) an external fixator was used. Total hip arthroplasty was performed in 02 patients (4.9%).

The average time to surgery was 12 days with extremes of 10 days to 12 months. Associated dislocations were reduced by a bloody route (5 cases) or by external manipulation (8 cases). The average hospital stay was 4.3 weeks with extremes of 1.3 weeks and 8 weeks.

Complications according to the type of treatment are summarized in Table 4.

Table 2: Distribution of bone lesions according to Judet-Létournel

Judet Letournel Classification		Staff	%
Elementary lésion	Posterior wall	15	36,6
	Posterior column	6	14,6
	Anterior wall	1	2,4
	Anterior column	0	0
	Pure Transverse	5	12,2
Complex lésion	Transverse + Posterior wall	3	7,31
	T-shaped fracture	2	4,8
	Posterior column + Posterior wall	6	14,6
	Anterior column + h�mi transverse posterior	1	2,4
	Two columns fracture	2	4,8
Total		41	100

Table 3: Distribution according to associated lesions

Associated injuries	Staff	%
Hip dislocation	23	56,1
Limbs fractures	17	41,5
Cranio-faciales lesions	06	18,18
Thoracic lesions	03	9,1
Pelvis ring fracture	10	30,3
Polytrauma	12	29,2



Fig 2: Post-operative pelvis x-ray: on right external fixation; on left osteosynthesis by screwed plate of the acetabulum combined with nailing femur.

Table 4: Distribution of complications according to treatment

Complications	Orthop�dique	Ost�osynth�se	Arthroplastie
Hematoma	00/23	11/16	01/02
Screw removal	00	02/16	00
Joint stiffness	16/23	3/16	00
Head femoral necrosis	5/23	/16	00
Vicious cal	18/23	3/16	00
Inequality of length limbs	5/23	/16	00
post traumatic coxarthrosis	19/23	6/16	00
H�t�rotopic ossification	00/23	02/16	01/02

Orthopaedic case 23; Osteosynthesis case 16; Arthroplasty case 02.

In general, these complications are dominated by joint stiffness, vicious callus, and post-traumatic osteoarthritis respectively in 46.3% (19 cases) 51.2% (21 cases) and 60.1% (25 cases) of cases. No thromboembolic complications or deaths during hospitalization were noted. Post-operative haematoma was frequent in cases of osteosynthesis (11/16).

Vicious callus (18 cases), joint stiffness (16 cases) and hip osteoarthritis (19 cases) were prevalent in cases treated orthopaedically.

During the review, 32 patients were reviewed. Among the reviews there were 16 orthopaedic treatments, 14 osteosynthesis and 2 arthroplasties. The mean PMA [5] score of the series was fair (12.5 points). The PMA scores by type of treatment are summarized in Table 5. Surgically managed patients had excellent and good PMA scores in 75% of patients. Those treated orthopaedically had an excellent and good PMA score of only 6.25%.

Table 5: Distribution of PMA score according to treatment

PMA (Score)	Surgery		Orthopaedic	
	N	%	N	%
Excellent (=18)	5	31,3	0	00
Good (15-17)	7	43,7	1	6,3
Fair (13-14)	4	25,0	8	50,0
Médiocre (9-12)	0	00	5	31,3
Bad (<9)	0	00	2	12,4

Surgery treatment: 16 case; orthopaedic treatment 16 case

Discussions

The objective of this retrospective and descriptive work carried out in our Trauma Department of the Cocody University Hospital Centre in Abidjan is to describe the main epidemiological, clinical and therapeutic characteristics of acetabular fractures in the hospital environment in Abidjan. Despite the methodological limitation of being retrospective and non-comparative, the study raises the following epidemiological, clinical and therapeutic discussion points.

Epidemiologically, acetabular fractures represent 2.2% of hospitalizations in our cohort, whereas in the literature it varies between 14-22% [1-2];[8] depending on the series.

They therefore appear to be infrequent in our current practices.

These fractures are often the result of high-energy trauma and therefore often associated with other lesions (72.7% of our patients) or even polytrauma (21.9% of cases).

The mean SSI of our series (18.16 points) is higher than that reported by Hicham [8] (13.6 points) despite the similarity of the traumatic circumstances (road accidents, falls from a high place, then landslides). This shows the severity of the clinical picture that could result from this type of fracture.

Fractures of the acetabulum preferentially affect adults, both males and young people, as shown by the average age of 38 years. This segment of the population is very active and therefore very exposed to violent accidents. Hicham [8] reported an average age of 42.5 years.

According to the literature [9]-[10], road accidents are the main etiology (70.7% in our series). However, occupational accidents are also incriminated (29.3% in our series). The absence and/or non-observance of safety conditions could explain their occurrence.

Specific imaging such as CT scan with 3D reconstruction has contributed to a better understanding and good preoperative planning. However, its high cost limits its realization in some patients. In fact, only 54.5% of patients were able to comply with the CT scan prescription.

From a therapeutic point of view, this study shows that the management of acetabular fractures is difficult in our conditions; because of limited financial resources and in the absence of mutual insurance, patients cannot bear the cost of surgical treatment.

This explains the high frequency of orthopaedic treatment (56.1%) compared to surgery (45.9%). The orthopaedic method thus appears as an alternative in the absence of osteosynthesis.

Acetabular cup surgery is known to be invasive, which explains the prevalence of postoperative hematoma observed. Heterotopic ossifications are frequent complications of acetabulum surgery with a rather varied incidence according to the series [8];[11]. We observed 7.3% heterotopic ossification. This study also found that orthopaedic treatment is a source of rather disabling late complications. However, some of the authors obtained good functional results with the orthopaedic method. This difference can be explained by the diversity of the anatomic-pathological varieties of the series.

Within the framework of an orthopaedic damage control procedure, provisional exofixations were performed, but due to lack of financial means, they remained definitive in 04 patients. The arthroplasties performed were secondary indications in the face of advanced coxarthrosis in relation to the time required for treatment. In fact, the use of bonesetters is still legion in our population, leading to a delay in consultation.

In one of the patients this delay was 7 months and in the other 13 months.

On the functional level, the analysis of our cohort suggests that surgical treatment of acetabular fractures is associated with better functional results than orthopaedic treatment. However, a potential bias in judgment exists for comparing these two methods without taking into account the anatomic-pathological type.

Conclusion

Although uncommon in our institution, the characteristics of acetabular fractures are those of young adults with clinical and therapeutic aspects similar to those found in the literature. However, this young adult, who does not have sufficient financial resources, can only afford orthopaedic treatment with serious functional sequelae. The functional prognosis of acetabular fractures remains but strongly dependent on the therapeutic method.

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