

# Epidemiological and Therapeutic Aspects of Obstetric Fistula in 2021: A Review of 97 Cases at the Departmental University Hospital Centre of Borgou and Alibori in Benin

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## Abstract

**Background:** Obstetric Fistula (OF) is a breach of the birth canal due to obstructed labor. It is a major public health problem in developing countries. **Objective:** Study the epidemiology and treatment of obstetric fistulas at the Departmental University Hospital Centre of Borgou and Alibori (CHUD-B/A) in Parakou, Benin. **Study Method:** This was a descriptive and analytical cross-sectional study with prospective data collection on women treated during OF care missions from February 2020 to April 2021 in CHUD-B/A in Parakou, Benin. The data concerned their socio-demographic characteristics, obstetric history, the clinic and therapeutic characteristics of their obstetric fistulas. **Results:** In total 97 patients with OF were treated during the 14-month period. The average age of the patients was  $36.42 \pm 11.75$  years old. The patients were married (51.54%), without professional occupation (54.64%) and had no formal education (73.20%). The vesico-vaginal variety was predominating (54.64%). The fistulas were of Type I (46.39%), Type II (20.62%) and Type III (32.99%) according to the classification of Waaldjik Kees. The patients were operated on under spinal anesthesia (94.79%), and vaginally (55.67%) according to the principle of Chassar Moir (68, 60%). The associated procedures were lengthening urethroplasty (17.53%), and interposition of the Martius flap (1.03%). The overall success rate without Stress Urinary Incontinence was 71.13%. The factors associated with the failure of the fistula repair were: the nutritional status of the patients ( $p = 0.004$ ), the previous repair failure ( $p = 0.001$ ), the high size of the fistula ( $p = 0.007$ ), the fistula severity ( $p < 0.001$ ), and a urethral reconstruction ( $p < 0.001$ ). **Conclusion:** OF is a relatively frequent pathology

in Benin. Vesico-vaginal fistula is the most common form. The success rate of the surgical treatment is satisfactory, but depends on some factors.

## Keywords

Benin, Epidemiology, Obstetric Fistula, Treatment

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## 1. Introduction

Obstetric Fistula (OF) is considered as one of the most serious and disabling complications related to childbirth, according to the World Health Organization (WHO), it is a breach in the birth canal due to difficult labor (dystocia) during childbirth delivery [1]. In the majority of cases, OF has a high incidence in developing countries, they are mainly a consequence of prolonged obstructed labour due to poor management leading to ischemic compression of the bladder neck by the fetal head wedged in the pelvis. It could also result from forceps delivery or caesarean section performed by an inexperienced or poorly trained operator [2]. Obstetric fistula has almost disappeared in developed countries because interventions are performed there on time, in the event of prolonged cessation of labour, usually caesarean sections [1].

However, there is a major public health problem, according to the WHO, about 2 million women in the world are living with untreated obstetric fistula in Asia and Sub-Saharan Africa [1]. The incidence of OF is estimated at 0.32% of deliveries in French-speaking African countries, which represents about 5000 new cases per year (*i.e.* 40,000 to 50,000 fistula patients) for these thirteen countries [2]. There were 110,800 cases in Ethiopia in 2015 according to Maheu-Giroux *et al.* [3]. In Benin, approximately 8 out of a thousand women of childbearing age reported to have had an obstetric fistula according to data from the National Institute of Statistics and Economic Analysis (INSAE) [4]. This incidence is high compared to the regional frequency, in West Africa, which is 3 per 1000 [3]. Women with obstetric fistula suffer from permanent incontinence, feel shame and are subject to social discrimination unless they are treated. This preventable condition also leads to long-term chronic medical problems, such as skin infections, kidney problems, and even death if left untreated [1].

The objective of this study was to study the epidemiological characteristics and treatment of obstetric fistulas from February 2020 to April 2021 at the Departmental University Hospital Centre of Borgou and Alibori (CHUD-B/A) in Parakou, Benin.

## 2. Materials and Methods

### 2.1. Study Setting

The study took place in the Department of Gynecology and Obstetrics of the Departmental University Hospital Centre of Borgou and Alibori (CHUD-B/A). This hospital is located in the city of Parakou in Benin.

## 2.2. Study Design

This was a descriptive and analytical cross-sectional study with prospective data collection on women treated during OF care missions from February 2020 to April 2021 in CHUD-B/A, Parakou, Benin. We included all the women who had been treated during OF care missions at the Departmental University Hospital Centre of Borgou and Alibori during the study period, and who had given their consent to participate in the study.

## 2.3. Data Collection

We reviewed the records of all the patients operated on who met the inclusion criteria. The expected sample size was the total number of cases operated on during these management campaigns at CHUD-B/A during the study period. Data were collected using questionnaire designed for this study through interviews of the patients during their admission, their medical records and the operating room registry.

## 2.4. Study Variables

The dependent variable was obstetric fistula.

The independent variables were:

- Sociodemographic characteristics: origin, age of patients on admission, age at marriage, age at first delivery, height, weight, Body Mass Index (BMI), level of education, marital status before and after fistula, occupation before and after fistula.
- Obstetrical characteristics: parity at the time of occurrence of the fistula, parity, duration of labour, place of delivery, mode of delivery (vaginal route, cesarean section), condition of the newborn at birth (stillborn, alive, neonatal death), the sex of the newborn, the weight of the newborn.
- Characteristics of the fistula: age of the fistula, size of the fistula, number of previous treatments, site of the fistula, type of the fistula, associated lesions.
- Treatment and results: type of anesthesia, approach, type of treatment, surgical technique, overall success rate without Stress Urinary Incontinence (SUI).

## 2.5. Data Processing and Analysis

Data entry was performed using Epidata 3.1 software and analysis was performed using Epidata analysis software.

## 3. Result

In the present study, 97 cases of obstetric fistulas were recorded over a period of 14 months.

### 3.1. Sociodemographic Data

The average age of patients at the time of treatment was  $36.42 \pm 11.75$  years with

a range of 17 and 65 years. About 27.84% (27/97) of the patients had under 30 years old. Those who had no formal education represented 73.20% (n = 71) of cases. At the socio-economic level, more than 54.64% (n = 53) of the patients were without professional occupation. At the onset of OF, the proportion of married women went from 97.94% to 51.54%, *i.e.* a separation rate of 35.05% (**Table 1**). The patients came mainly from a rural area, *i.e.* 84.54% (n = 82). A proportion of 63.92% (62/97) of the patients came from the southern region of the country.

**Table 1.** The socio-anthropometric characteristics and information source of patients with obstetric fistula at the Departmental University Hospital Centre of Borgou and Ali-bori (CHUD-B/A) in 2021.

	Attendance	Percentage (%)
<b>Age (years)</b>		
<30	27	27.84
≥30	70	72.16
<b>BMI* (kg/m<sup>2</sup>)</b>		
Underweight (<18.5)	8	8.25
Normal (18.5 - 24.99)	68	70.10
Overweight (25 - 29.99)	14	14.43
Obesity (≥30)	7	7.22
<b>Area of Residence</b>		
Urban	15	15.46
Rural	82	84.54
<b>Marital Status</b>		
Before Fistula		
Married	95	97.94
Single	2	2.06
After Fistula		
Married	50	51.54
Single	47	48.45
<b>Occupation</b>		
Employed	44	45.36
Unemployed	53	54.64
<b>Information Source about OF**</b>		
Non-Governmental Organization	40	41.24
Health Workers	38	39.18
Media (Radio, Television)	26	26.80
Neighbors	11	11.34

\*Body Mass Index; \*\*Obstetric Fistula.

### 3.2. Obstetric Characteristics

The average parity was  $2.5 \pm 2.0$ , labor duration was superior to 24 hours in 75.26% of the patients and the predominant mode of delivery was maternal by emergency cesarean section in 58.76% of cases (**Table 2**).

**Table 2.** The Gyneco-Obstetric history of the 97 patients admitted for obstetric fistulas at the Departmental University Hospital Centre of Borgou and Alibori (CHUD-B/A) in 2021.

	Attendance	Percentage (%)
<b>Reason for Consultation</b>		
Urinary Discharge	89	91.75
Anal Discharge	7	7.22
Urinary + Anal Discharge	1	1.03
<b>Parity</b>		
Primiparous	25	25.77
Pauciparous (2 - 3)	30	30.93
Multiparous (4 - 5)	22	22.68
Grand Multipara ( $\geq 6$ )	18	18.56
<b>Place of delivery</b>		
Home Birth	1	1.03
Health Center	96	98.97
<b>Duration of Childbirth Work</b>		
<24 hours	24	24.74
$\geq 24$ hours	73	75.26
<b>Length Lived with Fistula</b>		
<12 months	27	27.84
12 - 60 months	23	23.71
60 - 120 months	36	37.11
>120 months	11	11.34
<b>Circumstance of Occurrence of the Fistula</b>		
Vaginal Birth	27	27.83
Instrumental Extraction	11	11.34
Caesarean Section	57	58.76
Caesarean Hysterectomy	13	13.40
<b>New-born Condition</b>		
Alive	17	18.89
Perinatal Death	73	81.11
<b>Alternative Treatments Performed</b>		
Traditional Medicine	75	77.32
Psychological Support	17	17.53

### 3.3. Anthropometric Characteristics

Patients with an obstetric fistula had an average weight of  $53.78 \pm 11.24$  kg with a range of 35 and 89 kilogram. The average height of our patients was  $1.53 \pm 0.08$  metre with range of 1.25 and 1.7. About 32.99% ( $n = 32$ ) had a height of less than 1.50 metre. A proportion of 8.25% (8) of our patients were underweight. A proportion of 39.18% of the patients had married under the age of 18 years.

### 3.4. Characteristics of Fistulas

The mean size of the fistulas was  $1.9 \pm 1.8$  cm with extremes of 0.5 and 4 cm. The average time lived with the fistula was 72.29 months or about 6 years with extremes of 1 month and 480 months. Most patients (72.16%) had lived more than 12 months with the fistula. Associated lesions were ammoniacal dermatitis in 72.16% ( $n = 70$ ) of cases, vaginal sclerosis in 28.87% ( $n = 28$ ) of patients and genital mutilation 3.09% ( $n = 3$ ) of patients (**Table 3**).

**Table 3.** Distribution of the 97 patients according to the characteristics related to their obstetric fistula at the Departmental University Hospital Centre of Borgou and Alibori (CHUD-B/A) in 2021.

	Attendance	Percentage (%)
<b>Multiple Fistula</b>		
Yes	11	11.34
No	86	88.66
<b>Waldijk Classification</b>		
I	45	46.39
II	20	20.62
III	32	32.99
<b>Fistula Size (cm)</b>		
<2	57	58.76
$\geq 2$	40	41.24
<b>Location of Fistula</b>		
Vesico-uterine	17	17.52
Vesico-vaginal	53	54.64
Urethro-vaginal	16	16.49
Uretero-vaginal	13	13.4
Rectovaginal	3	3.09
<b>Condition of the Vaginal Tissue</b>		
Soft Tissues	75	77.32
Sclerotic Tissues	29	29.90
<b>Genital Mutilation</b>		
Yes	3	3.09
No	94	96.91
<b>Previous Repair of the Fistula</b>		
Yes	23	23.71
No	74	76.29

### 3.5. Therapeutic Data

Obstetric fistula repairs were performed under spinal anesthesia in a proportion of 94.79% (n = 91) and under general anesthesia in a proportion of 2.08% (n = 2). Spinal anesthesia was combined with general anesthesia in 3.13% (n = 3) of cases.

A proportion of 55.67% (n = 54) patients with an obstetric fistula had been treated surgically via the vaginal route in the supine position. The abdominal route involved 36.08% (n = 35) of patients. For 7.22% (n = 7) of the patients, the intervention had been performed by a mixed approach.

Fistulorrhaphy after splitting of the vesico-vaginal wall inspired by the principle of Chassar Moir was the most practiced with a frequency of 68.04% (66/97), uretero-vesical reimplantation in 11.34% (33/97) of case. One patient had been treated by simple indwelling bladder catheterization. The associated procedures were the interposition of a fatty flap from Martius in one patient (1.03%), vesico-urethral anastomosis in T (1.03%), and lengthening urethroplasty (17.53%). Rectovaginal fistulas were treated using the Musset technique.

We recorded a proportion of 19.59% (19/97) of postoperative complications. These complications were parietal suppuration 12.37% (12/97) or bleeding 7.21% (7/97).

The time taken to remove the probes was on average 14 days with extremes of 2 and 30 days. More than 2/3 (67.01%) of the patients had kept their catheter between 10 and 14 days.

### 3.6. Outcomes of Treatment

The overall success rate was 78.35%. About 2.63% of recovered cases had Stress Urinary Incontinence (SUI). The factors associated with the failure of obstetric fistula repair were: The nutritional status of patients (p = 0.004), a previous repair failure (p = 0.001), the large size of the fistula (p = 0.007), the fistula severity (p < 0.001), a urethral reconstruction (p < 0.001; PR > 1) (**Table 4**).

**Table 4.** Factors associated with failed repair of obstetric fistula at the Departmental University Hospital Centre of Borgou and Alibori (CHUD-B/A).

	N	OF Cure Failure		PR	95% CI	p
		n	%			
<b>BMI</b>						0.004
Underweight (<18.5)	8	4	50.00	4.25	1.64 - 11.00	
Normal (18.5 - 24.99)	68	8	11.76	1		
Overweight (25 - 29.99)	14	6	42.86	3.64	1.50 - 8.86	
Obesity (≥30)	7	3	42.86	3.64	1.24 - 10.67	
<b>Genital Mutilation</b>						0.355
Yes	3	0	0.00	0.00	-	
No	94	21	22.34	1		

## Continued

<b>OF* Previous Repair Failure</b>						0.001
Yes	23	11	47.83	3.54	1.73 - 7.25	
No	74	10	13.51	1		
<b>OF* Severity</b>						<0.001
I	45	6	13.33	1.07	0.33 - 3.48	
II	20	11	55.00	4.40	1.62 - 11.95	
III	32	4	12.5	1		
<b>OF* Size (cm)</b>						0.007
<2	57	7	12.28	1		
≥2	40	14	35.00	2.85	1.27 - 6.42	
<b>Simple Fistulorrhaphy</b>						0.334
Yes	46	8	17.39	0.68	0.31 - 1.50	
No	51	13	25.49	1		
<b>Reconstruction of the Urethra</b>						<0.001
Yes	17	13	76.47	7.65	3.77 - 15.53	
No	80	8	10.00	1		
<b>Ureteral Reimplantation</b>						0.064
Yes	11	0	0.00	0.00	-	
No	86	21	24.42	1		

\*Obstetric Fistula.

#### 4. Discussion

Mean patients age at the time of OF treatment was  $36.42 \pm 11.75$  years with extremes of 17 and 65 years. This average age is like that reported by Tebeu *et al.* [5] in Cameroon and Salifou *et al.* [6] in Benin which were respectively  $36.2 \pm 14.3$  years and  $36.6 \pm 10.5$  years. However, it is higher than those reported by Nsambi *et al.* [7], which were  $27.96 \pm 10.37$  years. The age difference would be due to the period of management after the occurrence of fistulas, which is as longer as the subsidies are not quickly available. The subsidies come from different strategies for the management of obstetric fistulas implemented in these countries. Educationally, patients with no formal education represented 73.20% (n = 71) of cases. This frequency is similar to that reported by Diallo *et al.* [8] in Guinea which was 66.4%. However, it is lower than those reported by Salifou *et al.* [6] in Benin, Nsambi *et al.* [7] in the Democratic Republic of Congo (DRC), Aristide Kaboré *et al.* [9] which were respectively 81.1%; 94.7%; and 92.5%. This better level of education in our series could be explained by the efforts African countries including Benin to promote education and literacy for all.

At the socio-economic level, more than half of the patients, or 54.77%, were unemployed housewives. Many women lose their jobs after the onset of obstetric fistula. Loss of employment appears to be an economic consequence of fistula.



Obstetric fistula is a condition that aggravates precariousness.

The separation rate of couples in this series was high 35.05%. This rate was similar to those reported by Salifou *et al.* [6] in Benin and Aristide Kaboré *et al.* [9] in Burkina Faso, which were 32.4% and 32.4% respectively. Conjugal dislocation, in particular the abandonment of the patient, is one of the serious psychosocial consequences of OF.

The patients mainly came from a rural area, *i.e.* 84.54%. Salifou *et al.* [6] reported in Benin that 81.1% patients came from rural areas. In the series of Diallo *et al.* [8] in Guinea, all women came from remote rural areas. Rural areas are characterized by a lack of technical equipment, infrastructure, and qualified personnel for the administration of health care, socio-cultural and religious mores which explain the delay in accessing quality care.

The main sources of information and orientation of patients on the treatment of fistula were Non-Governmental Organizations (NGOs) (41.24%). This advanced strategy indeed appears to be ideal for better reaching women suffering from OF, as observed in the work of Diallo *et al.* [8].

A proportion of 25.77% of patients were at their first delivery. In the literature, obstetric fistula predominates in primiparous women. Umoiyohe *et al.* [10] in Nigeria in 2012 and Nsambi *et al.* [7] in the Democratic Republic of Congo reported respectively 80.9% and 90.9% primipara in their series. Other studies, on the other hand, had noted a predominance of multiparas: Salifou *et al.* [6] (73%). Parity does not appear to be a risk factor for the occurrence of Obstetric Fistula (OF), although primiparity associated with young maternal age expose to a higher risk of OF due to pelvic immaturity.

The majority of our patients had given birth in a health structure 98.97% after a prolonged childbirth work. Salifou *et al.* [6] also reported a high proportion of births in a health center (83.8%). Contrary to these studies, other authors reported high rates of home birth: 70% for Nsambi *et al.* [7].

A proportion of 75.26% of our patients had had a duration of labor delivery greater than 24 hours. Nsambi *et al.* [7] noted that 87.6% of patients in their study had a labor of more than 24 hours [11]. Sori *et al.* [12] in Ethiopia reported more than 48 hours of labor in 79.2% of their patients. According to Meyer *et al.* [13] childbirth is complicated by fistula due to financial, cultural, and geographical reasons that prevent the woman from benefiting from quality care during childbirth.

The fistula was secondary to an emergency caesarean section in a high proportion: 58.76% cases in this study. Salifou *et al.* [6], Roka *et al.* [11] noted respectively 70.3% and 60% cesarean rate in their series. The ischemia having already been established, the caesarean could not avoid the fistula, and was only performed for maternal salvage, as evidenced by the high rate of stillbirths. The causal pregnancy ended in a stillbirth in 68.37% of cases with a clear predominance of 69.39% of male newborns. In the literature, perinatal mortality is also high: Roka *et al.* [11] and Nsambi *et al.* [7] had respectfully reported 78.6% and 93.4%. The observed male predominance of stillbirths would be linked to the

tendency for macrosomia, of which the male sex is one of the predictive factors.

The patients had a mean weight of  $53.78 \pm 11.24$  kg. Nearly half of the patients 45 (46.39%) weighed less than 50 kg. These results corroborate those reported by other authors: For Lewis Wall *et al.* [14], the average weight was 43.6 kg and 55% of patients weighed less than 50 kg.

The average height of our patients was low  $1.53 \pm 0.08$  metre and a proportion of 32.99% ( $n = 32$ ) of them had short stature (height < 1.50 metre). Other studies had reported high proportions of short women in their series: In the series by Nsambi *et al.* [7] in the DRC, the average height was low  $145.1 \pm 7.1$  cm and 73.2% of patients were of short stature. The average height in the series by Holme *et al.* [15] was 148 cm. Most authors recognize that short stature is a predictor of obstructed labor: Lewis Wall *et al.* [14] and Le Le Duc *et al.* [16].

In our series, there was a proportion of 8.25% lean patient ( $BMI < 18.5 \text{ kg/m}^2$ ). This stature weight deficit found in other studies on obstetric fistulas would be due to malnutrition and early pregnancies occurring before the end of puberty, precociously reducing growth [17].

In the present study, Type I fistulas according to the classification of Waaldijk Kees 46.39% predominated. The Vesico-Vaginal Fistula (VVF) variety was the most represented 54.64%. The series by Kaboré *et al.* [9], Salifou *et al.* [6] also noted a predominance of the vesico-vaginal form of 70.6% and 62.2% respectively. It appears that VVF is the most commonly encountered form of obstetric fistula. Recto-Vaginal Fistulas (RVFs) are rare.

The average size of obstetric fistulas was  $1.9 \pm 1.8$  cm. It was  $2.47 \pm 1.46$  cm according to Nsambi *et al.* [7]. This variation in the dimensions of the fistula could be explained by several factors, in particular the duration of labor and the surface area of the compressed tissues.

The majority of patients (72.16%) had lived more than 12 months with the fistula. The average time lived with the fistula was 72.29 months or about 6 years. This average is similar to those reported by Tebeu *et al.* [5] and Nsambi *et al.* [7] respectively 8.5 years and  $4.97 \pm 4.76$  years. It is lower than the result of Diallo *et al.* [8] in Guinea: 11 years. Several factors could explain this variation in the duration lived with the fistula according to the studies: On the one hand the stigmatizing character of the pathology pushing the patients to isolation, the long clinical tolerance of the disease, the ignorance of the existence of a surgical management of the affection, the lack of financial means. On the other hand, through awareness-raising by local NGOs, healthcare personnel via the media, community relays, and free care campaigns, these women, as well as those around them.

In our series, the main mode of anesthesia performed was spinal anesthesia 94.79% ( $n = 91$ ). Several other studies have noted similar results. The series by Nsambi *et al.* [7] and Sori *et al.* [12] respectively reported 99% and 70.8% spinal anesthesia performed. There are many reasons for choosing this locoregional anesthesia. It allows effective and reliable anesthesia of the lower part of the trunk and lower limbs, reduces the postoperative consequences induced by gen-

eral anesthesia, preserves the patient's lucidity, and allows her to eat early post-operatively.

A proportion of 55.67% of patients had been treated surgically via the vaginal route in the supine position. These results are comparable to those of Cisse *et al.* [18] in Mali and Moudouni *et al.* [19] where respectively, the vaginal approach was used in 100% and 70% of patients. The priority given to this vaginal route can be explained by the fact that in most obstetric fistulas it gives good operating comfort, direct access to lesions of the cervix and urethra, reduces the risk of complications, leads to less bleeding, rapid postoperative recovery and short hospital stay [2].

Regarding the operative techniques used, fistulorrhaphy inspired by the principle of Chassar Moir was the most practiced with a frequency of 68.04%. Niassy *et al.* [17] noted a similar frequency of 78.9% fistulorrhaphy according to the Chassar Moir principle. This surgical technique remains the most used approach, because it is simple, less demanding, with a low risk of complications.

The overall success rate without SUI was 71.13%. A proportion of 2.63% of cases have had the fistula closed and presented with minor Stress Urinary Incontinence (SUI). This success rate is similar to those of several other authors including Holme *et al.* [15], and Salifou *et al.* [6] respectively 72.9% and 68.6%. It is lower than those of Kpatcha *et al.* [20] and Nsambi *et al.* [7] who noted overall success rates of 78.10% and 86% respectively. Our results are satisfactory but could be improved thanks to the experience of the surgeons.

In our series, the factors associated with the failure of surgical repair of obstetric fistulas were the nutritional status of patients ( $p = 0.004$ ), a previous cure failure ( $p = 0.001$ ), the large size of the fistula ( $p = 0.007$ ), fistula severity ( $p < 0.001$ ), urethral reconstruction ( $p < 0.001$ ;  $PR > 1$ ). These factors are similar to those mentioned by Niassy *et al.* [17], which were the low rate of previous operations and the large number of fistulas without damage to the continence systems, the experience of the teams. For Nsambi *et al.* [7], the healing rate of obstetric fistulas was determined by the site of the fistula, the degree of healing, previous repair attempts, the technique of fistulorrhaphy and the expertise of the surgeon, equipment and post-operative nursing care among others. We deduce that the success rate of obstetric fistula surgery varies from center to center and depends on several factors.

## 5. Conclusion

Obstetric fistula remains a serious public health problem in Benin. The overall success rate of the surgical cure was satisfactory. Certain factors are associated with failure and will need to be considered in treatment strategies. The prevention of Obstetric Fistula requires refocused prenatal consultations and childbirth assisted by qualified personnel.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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