

Risk Factors for Urinary Incontinence after Obstetric Vesicovaginal Fistula Closure in Guinea

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Abstract

Introduction: Urinary incontinence after closure of vesicovaginal fistula is any involuntary loss of urine that a patient complains of. We aim to study the risk factors for urinary incontinence after closure of obstetric vesicovaginal fistula in Guinea in order to develop preventive measures to reduce its incidence. **Materials and Methods:** This was a retrospective, multiple center cohort of women operated on for obstetric vesicovaginal fistula during a 10-year period. **Results:** In 1770 vesicovaginal fistulas operated, 1347 were closed. 180 women (13.36%) developed urinary incontinence. After multivariate analysis, the risk factors of urinary incontinence after closure of vesicovaginal fistula were: the patient's age, the anatomical type III, iterative surgical intervention, the brevity of the urethra and decrease in bladder capacity. **Conclusion:** Urinary incontinence after closure of vesicovaginal fistula is a frequent problem in Guinea, the prevention of which should be integrated into the management of fistulas.

Keywords

Vesicovaginal Fistula, Surgery, Urinary Incontinence

1. Introduction

Vesicovaginal fistula (VVF) is an abnormal communication between the bladder and/or its cervix and the vagina resulting in involuntary and permanent loss of urine [1]. Although the success rate of treatment is up to 92% in simple cases, there are few centers for the management of fistulas. On this relatively high rate

of anatomic closure, a significant proportion of women remain with urinary incontinence (UI) [2].

It is clear that UI affects many spheres of life for affected women, including their physical and mental well-being, sexuality, social relationships, as well as their private and professional lives [3]. If it is possible at the cost of a real surgical effort to restore a satisfactory anatomy, the surgeon should not be satisfied with this. He must render continence otherwise, the result for patients remains exactly the same [4].

The study aims to determine the risk factors for urinary incontinence after closure of obstetric vesicovaginal fistula.

2. Material and Methods

The study covers all the obstetric fistula care centers in Guinea. The urology department of the Ignace Deen University and Hospital Center (Conakry). The maternity of the Jean Paul II Medico-social center (Conakry). The Djigui hope: social care center (Conakry). The maternity ward of the first degree hospital in (Kissidougou). The maternity ward of the Regional Hospital (Labé).

It was a retrospective, cohort of women operated for obstetric fistula during a 10-year period between January 1, 2005 and January 1, 2015.

The study focused on women operated for obstetric VVF during our study period and who met our selection criteria. We excluded the other forms of obstetric VVF (vesico-genito-rectal fistula and women in pregnancy). We carried out an exhaustive recruitment. We identified women in the consultation registers, individual medical records, operating report registers. We analyze patient's demographic data, medical record, surgical report and the short term follow-up.

The different characteristics of the women were presented in the form of mean \pm Standard deviation for the quantitative, frequency variables with a 95% confidence interval. The univariate analysis concerned the dependent variable or variable of interest (UI) and the following independent variables: the age of the patients, the obstetric history (parity, pregnancy on non closed VVF), fistula clinics characteristics (age of the fistula, anatomical type, condition of the bladder neck, condition of the urethra), management characteristics of the fistula (number of curative surgeries, surgical intervention and duration of urinary catheter) and post-operative features (shortness of the urethra and decrease in bladder capacity).

To compare the 2 groups of women, the Student's t-test was used when the Pearson's Chi-squared test was not applicable. During the multivariate analysis, the odds ratio (OR) was calculated to measure the effects of variables whose P-value is $\geq 20\%$ during the univariate analysis on the occurrence of urinary incontinence after treatment of obstetric VVF. Statistical significance was made when the P-value is less than 0.05. Our data was processed by Epi-info software version 7.1.3 and then exported to Statistical Package for Social Scientists version 21 for analysis.

Ethical considerations: the research protocol was submitted to the administration of the respective sites for validation before the start of data collection. Confidentiality was guaranteed.

3. Results

Of the 1347 closed VVF, 1167 women (86.64%) had a bladder continence and 180 women (13.36%) [8.46; 18.26] had UI. The proportion of UI in relation to all 1770 VVF treated was 10.17% [8.76; 11.57].

Average age 36.74 years [35.74; 39.72]; from 15 to 70 years old. 103 (57.22%) [49.65; 64.55] had an age between 15 to 18 years at the time of the first parity and 7.78% [4.32; 12.71] under 15 years old. They were married in 60.56% housewives 85.38% and lived in rural areas 88.33%. Women with UI had a higher first parity rate compared to those without UI. The mean age of VVF was 12.67 (± 1.72) with extremes of 0.03 and 50 years. The clinical features were marked by destruction of the bladder neck and urethra with a predominance of type 3 in the group of women with UI (**Table 1**).

Among these 180 incontinent women, vaginal approach was the most used surgical approach in 174 women (97.89%). The mean duration of the urinary catheter was 18.36 (± 11.85) from 7 to 21 days. Postoperative features were marked by the shortness of the urethra in 107 cases or 59.44% and the decrease in bladder capacity in 73 cases or 40.55%. Stress UI was the most common type in 43.33%. 7% had urinary urgency UI, and 4% had mixed UI. However in 81 women (45%), the type of UI was not determined. The surgical procedures consisted in addition to fistulorrhaphy, urethroplasty, making of a new cervix.

Table 1. Comparison of the clinical characteristics of vesicovaginal fistulas in the 2 groups of women in Guinea from January 1, 2005 to January 1, 2015.

Clinics characteristics	IU - n = 720(%)	IU + n = 180(%)	P-value
<i>Mean age (years)</i>	8.32	12.67	0.0000
<i>Bladder neck statut</i>			0.000
Normal	524 (72.8)	57 (31.7)	
Partial destruction	142 (19.7)	84 (46.7)	
Total destruction	51 (7.1)	38 (21.1)	
<i>Urethra statut</i>			0.000
Normal	545 (75.7)	2 (1.1)	
Partial destruction	136 (18.9%)	65 (36.1)	
Total destruction	8 (1.1)	81 (45)	
<i>Type of fistula*</i>			0.000
Type 1	312 (43.3)	14 (7.8)	
Type 2	271 (37.6)	74 (41.1)	
Type 3	131 (18.2)	89 (49.4)	

*Type: type 1: (rétro trigonal, trigonal), type 2 (bladder neck, urétral, urétral cervix without transversal section) et type 3 (cervix, urétral, urétral cervix with transversal section).

Table 2. Multivariate analysis of risk factors for urinary incontinence after obstetric vesicovaginal fistula treatment in Guinea from January 1, 2005, to January 1, 2015.

Variables	OR	IC 95%	P-Value
<i>Mean age of the patient</i>	1.2		0.003
<i>Mean age of the fistula</i>	1.07	1.01 - 1.06	0.002
<i>Parité</i>			0.367
First parity	1.31	0.69 - 1.42	0.4055
Low parity	1.55	0.80 - 2.03	0.1902
<i>Involvement of de bladder neck</i>			0.096
Partial	1.41	0.77 - 2.52	0.254
Total	2.45	1.08 - 5.53	0.031
<i>Type of the fistula</i>			0.002
Type 2	2.20	1.04 - 4.65	0.038
Type 3	4.27	1.86 - 9.81	0.001
<i>Iterative surgical procedure</i>			0.000
First	0.15	0.05 - 0.48	0.000
third	0.43	0.15 - 1.22	0.144
Fourth or more	0.56	0.18 - 1.76	0.328
<i>Duration of urinary catheter (days)</i>			0.279
8 - 14		0	0.996
15 and more	0.4	0	0.996
<i>Meatus plasty</i>	0.9	0	0.999
<i>Shortness of the urethra</i>	5.32	2.73 - 10.37	0.000
<i>Reduction of bladder capacity</i>	1.76	1.04 - 2.98	0.035

Table 3. Comparison of the number of obstetric VVF documented in Guinea to wich in other countries.

Auteurs	Country	Duration (year)	Number of VVF
Our study	Guinea	10	1770
S. M. Gueye [5]	Senegal	6	123
Benchekroun [6]	Morocco	30	1050
R. Kimassoum [7]	Chad	3	363
Bernis L [8]	Developing countries	-	-

Women with UI had the most multiple procedures to get the fistula closed. The risk factors are represented in **Table 2**.

4. Discussion

VVF is a public health problem whose circumstances of occurrence and incidence vary according to the level of health development from one country to another [5]. One of the most visible indicators of the huge differences in health between developed and developing countries is the persistent incidence of ob-

stetric fistula in resource-poor regions [6]. We compare the number of documented fistulas compared to other countries [5] [6] [7] [8] (Table 3).

The frequency of UI after closure of obstetric VVF was 13.36% 95% [8.46; 18.26]. This result, although less than 17.5% [14.8 to 20.2] found by A. Delamou [9] in Guinea, the difference is not statistically significant. A. Lewis [8] in Sierra Leone reports a 10% prevalence of UI after FVV repair. The average age of incontinent women was 36.74%. R. Kimassoum [7] in Chad found an average age of 26.8 years. In the series of A. Browning [10] in Ethiopia, the women were younger 22.5 years. One hundred and three (103) women were between 15 and 18 years of age at the time of the first parity. Analysis of the obstetric history shows that 26.11% of incontinent women continued to conceive even though their fistulas were not closed. The time of surgery is much discussed, but in most cases, a 3-month deadline is respected. Early management could expose to inflammatory tissue and tissue bleeding easily [2]. Women lived with their fistula from 0.03 to 50 years. In Ethiopia, A. Browning [10] found fistulas between 0.16 and 50 years old.

The fistulas which interest the continence system were more frequent affecting the bladder neck with urethral destruction. These results are consistent with data from the literature which states that UI is more common in fistulas involving the bladder neck (type 2), the urethra (type 2) but especially in transversal section (type 3) where the sphincter system may have completely disappeared [6] [7] [9] [11].

Of these incontinent women, 68.89% had iterative surgery to repair their fistula. This high rate of iterative surgery is well above 33% reported by Mr. Oxana [12] in Liberia; and that found by K. Waaldjik [13] in Nigeria 26%. A. Demisew *et al.* [14] in Ethiopia reported a lower proportion (8.3%) of women who underwent iterative surgery to repair their fistulas. This may have depended on the initial characteristics of the fistulas, associated lesions, surgical technique, post-operative care and the experience of the surgeon.

The first principles for the treatment of VVF were published in the XVIIth century by Hendrick Von Roonhuysen and since then, a significant number of techniques have been described [15]. For type 1 fistulas, simple fistulography was the procedure performed. In the other anatomical types, other surgical techniques were associated with fistulography such as the making of a new bladder neck, plasty of the urethral meatus, urethroplasty, cervix-urethral anastomosis.

The duration of urinary catheter is the subject of controversy, which will no doubt be resolved following ongoing randomized clinical studies [2]. The decision on the duration of the catheter is generally dependent on the complexity of the fistula. In our study, the duration of urinary catheter was from 7 and 21 days. M. A. Barone *et al.* [15] found that statistically 7 days of urinary catheter after repair of a VVF was not less than 14 days. This 7-day duration should be used for the care of women after repair of a simple fistula. However, they did not find an association between the duration of bladder catheter and the risk of failure of the fistula closure, retention of urine, or residual UI.

A. Delamou [9] in his study on the factors associated with the failure to close obstetric fistulas, found that the patient's age, the status of the urethra, the previous surgical repair were significantly associated with the occurrence of UI. The risk factors identified by A. Browning [10] in his study on the risk factors for residual UI after a VVF treatment were: parity, patient's age, destruction of the urethra and iterative surgery.

In our study, the risk factors for UI after treatment for VVF were: the age of the patient ($P = 0.003$); the age of the fistula ($P = 0.002$); anatomical type 2 ($P = 0.03$); anatomical type 3 ($P = 0.001$); total destruction of the bladder neck ($P = 0.031$); iterative surgery ($P = 0.000$); shortness of the urethra ($P = 0.000$) and decreased bladder capacity ($P = 0.035$).

Women who had total destruction of the bladder neck were 2.45 times more likely to develop UI after their VVF were closed than women who had an intact bladder neck. The anatomical type 3 and the shortness of the urethra increased the chances of becoming incontinent by 4.27 and 5.32 times, respectively. However, unlike A. Browning [10] we found that parity (primiparity and paucity), increases the chances of becoming incontinent but alone does not constitute a risk factor for urinary incontinence after closure of VVF.

5. Conclusions

Urinary incontinence after closure of vesicovaginal fistula is a public health problem and remains a major challenge in obstetric vesicovaginal fistula surgery.

Its prevention must be integrated into the first management of obstetric fistula.

Authors Contribution

This work is a medical doctorate thesis carried out by FB BALDE. Under the direction of Prof. AB DIALLO, it is a national study carried out in collaboration with urologists and epidemiologists. All the authors actively participated from the conception to the elaboration of the final document.

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Conflicts of Interest

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

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