



## Successful Anatomical Closure of Female Genital Fistula and Its Psycho-functional Impacts among Survivors in a Resource-poor Setting

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### Abstract

**Introduction:** Management of Genital tract Fistula (GF) goes beyond just an attempt at closing a "hole"; it involves restoration of damaged lives. We assessed the impacts of successful anatomical closure of female genital tract fistula on the quality of life, the urological, and sexual function of the patients.

**Methods:** This was a prospective longitudinal study of 115 patients with fistula repair that took place at the fistula unit between March 2018 and February 2021. The researchers followed up the patients for an average of 18 months (range 9-30 months). Data on quality of life were collected on admission and a year after repair using a questionnaire adapted from the World Health Organization Quality of Life (WHOQOL)-BREF. Other validated questionnaires used include Incontinence Impact Questionnaire-7 [IIQ-7] and Urogenital Distress Inventory-6 [UDI-6]. We used Student's t-test and Mann-Whitney U-test statistical analysis.

**Results:** The mean age in this study was 28.7 years  $\pm$  7.5. Only 16.5% developed GF between ages 15 and 20 years. Seventy four percent of the respondents developed GF following Prolong Obstructed labor while the remaining were iatrogenic. The successful anatomical closure rate was 91.6%. Median IIQ-7 and UDI-6 scores reduced significantly ( $P \leq 0.01$ ) from 25.5 and 16.5 preoperatively to 2.7 and 3.0 post-closure respectively.

**Conclusion:** Female Genital tract Fistula (GF) is a major reproductive health problem in our setting. We noticed significant improvements in urinary symptoms and distress, general well-being, and quality of life following successful repair.

**Keywords:** Functional outcomes; Psycho-social Impact; Successful repair; Genital tract fistula

### Introduction

Genital Fistula (GF) is still a significant health problem in low-resource countries despite the advancement in surgical techniques and improvement in health care delivery systems. Women living with GF suffer untold hardship because of the deleterious nature of the disease.

A GF is defined as "an abnormal communication between the female genital tract and urinary or intestinal tract leading to continuous (involuntary) leakage of urine or fecal from the genital tract" [1]. It is called Recto-vaginal fistula when it involves rectum and vagina. Vesico-vaginal fistula involves the bladder and the vagina. In combined genital fistula, both VVF and RVF co-exist. Utero-vesical fistula, the Uretero-vaginal fistula, and the Urethro-vaginal fistula are other types of fistulas. Causes of female genital tract fistula include; Obstetric (mainly from prolonged or obstructed labor), Iatrogenic (from damage during obstetric or gynecological procedures), and others (including fistula from sexual assault, unsafe abortion, female genital mutilation, and gynecological malignancies).

About 97% of GF in the low/middle income nations are from Prolong obstructed labor arising as a devastating complication of poorly supervised labor [2].

Previous surveys have emphasized the short-term effect of successful repair of GF among survivors [3,4]. However, there is a gap in knowledge regarding the changes in the overall quality

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as well as the long-term outcomes of urinary and sexual function of these women [5]. Our study bridged this gap by evaluating these indicators at an average of 18 months following successful anatomical closure of Genital fistula among our patients.

## Study Objectives

This study assessed the impact of successful anatomical closure of female genital tract fistula on the urinary, sexual function as well as the overall quality of life of the women.

## Materials and Methods

### Study design and setting

This prospective longitudinal study was carried out the study at Dame Olayinka Obaleye Obstetric fistula Center, Wesley Guild Hospital Unit of the Obafemi Awolowo University, Ile-Ife, Osun State, South-West Nigeria between March 2018 and February 2021.

### Sample size and Sampling technique

We recruited every eligible patient who had successful anatomical closure of their genital tract fistula during study period using convenient sampling technique and followed them up for an average of 18 months. We recruited 115 participants for this study. Those who refused to participate in the research and those who developed fistula from gynecological malignancy were excluded from the study.

### Data sources

This study utilized primary data obtained from eligible participants using four different data collection tools before and after successful anatomical closure of the female genital tract fistula.

### Data collection and tools

We used semi-structured interviewer administered questionnaire to collect bio-data of the patients and the jobs description of their spouses. The socioeconomic status of the women was stratified into classes 1 to 5 using the socio-economic stratification method by Olusanya et al. [6]. This system scored the woman's educational status from zero (0) to two (2) and scored husband's job description from one (1) to three (3). Women with tertiary education are scored zero while primary or no formal education are scored two. Husbands who are professionals (e.g., Lawyers, Engineers, Medical doctors etc.) are scored 1 while those who engaged in unskilled labors (e.g., Artisans) are scored three. The addition of husbands and wife's scores will give the socioeconomic class of the woman. In this study, classes 1 and 2 were grouped as upper social class, class 3 as a middle social class, while classes 4 and 5 were grouped as the lower social class to aid data analysis.

We collected data on the quality of life of the patients as well as their sexual and other functional outcomes on two occasions using the World Health Organization Quality of Life BREF (WHOQOL-BREF) questionnaire, Incontinence Impact Questionnaire-7 (IIQ-7), and Pelvic organ prolapse/Urinary Incontinence Sexual Questionnaire (PISQ-12) [7-9]. The participants considered their status over the past six months while completing the questionnaires. They were administered for the first time while on admission after confirmation of successful anatomical closure. The second occasion was a year after repair.

The data on the quality of life was collected using the World Health Organization Quality of Life BREF (WHOQOL-BREF) questionnaire. This questionnaire has 2 parts and contains 26 items obtained from the original WHOQOL bref-100. The first component examines the

patient's subjective assessment of her quality of life and satisfaction with her health. The second part assesses four domains- physical, psychological, social, and environmental health. We obtained the mean score in each domain by computing the mean of transformed scores converted to a 0 to 100 scale. A mean score of greater than 40 denotes good quality of life while less than 40 indicates poor quality of life in each domain.

Incontinence Impact Questionnaire-7 (IIQ-7) contains 7 questions. This questionnaire assesses the impact of urinary symptoms on the patient's physical and emotional well-being. A high score (14-28) indicates negative impact (range: 0-28). Sexually active patients were asked to complete the PISQ-12 to assess sexual function. This condition-specific questionnaire assesses sexual function in heterosexual women who suffer from Urinary incontinence. A lower score (0-20) indicates better sexual function (range: 0-48).

### Preoperative assessment of patients with genital fistula

During Examination under Anesthesia (EUA), the diagnosis of the diagnosis of the fistula is confirmed as well as the location of fistula, extent of fibrosis around fistula, and vaginal capacity the route of route of surgical repair is also determined at this point. We classified GF using Goh's classification system [10,11].

### Repair of the fistula

Depending on the type of fistula and whether or not there are other pelvic pathologies, abdominal or vaginal approach is used. Flaps and transposition grafts can be used during repair to improve blood flow to the fistula closure. These procedures are also important in facilitating skin covering when the vaginal mucosa is inadequate. Cough and dye tests are carried out after the repair to ensure water-tight closure of the fistula.

### Postoperative management

We secure the urethra catheter to the labia in the theatre. Adequate post-operative fluid therapy, urinary catheter management, infection prevention practices are ensured according to departmental protocol throughout care in the facility. Urethra catheter is retained for an average of 14 days post-repair.

### Confirmation of successful anatomical closure of GF

At the expiration of 14 days, the urethra catheter is removed following a negative dye test. The patient then undergoes bladder training. A woman is said to have achieved "Anatomical closure" if she remained continent after 24 h of bladder training.

### Pre-discharge counseling and follow up plan

Before leaving the hospital, the patients and their husbands undergo pre-discharge counseling. This counseling includes the need to adhere strictly to clinic follow up.

Other instructions include; penovaginal sexual abstinence for six months, contraceptive counseling and uptake of a method before resumption of sexual intercourse to delay pregnancy for at least a year from the time of successful repair. Further explanation is then given on the need for antenatal care and cesarean section for future pregnancies. The need for antenatal care and cesarean delivery in future pregnancies are further emphasized. Financial support is provided for our patients to encourage follow up visits. The important follow-up visits are at 4 weeks, 3 months, six months, and one-year post-repair. Those who missed any of the clinic visits were contacted on phone.

## Data analysis

We presented the results in mean  $\pm$  Standard Deviation (SD) and percentages. Un-paired T-test was used to compare two independent means and one-way Analysis of Variance (ANOVA) was used to compare more than two independent means. Paired t-test or Mann-Whitney U-test was used to compare the variables in the preoperative and postoperative periods. The p-value  $<0.05$  was considered statistically significant. All the analyses were performed using the Statistical Package for Social Science (SPSS) version 20 [IBM Corp. Released in 2011. IBM SPSS Statistics for Windows, Armonk, NY].

## Ethical consideration

We obtained ethical clearance from the ethics and research committee of Obafemi Awolowo University Teaching Hospitals Complex, Osun state. During data collection, the researchers informed the patients about the purpose of the study. They also discussed the confidentiality regarding the data as well as the right not to participate or withdraw at any time without affecting their health or other services.

## Results

### Recruitment and follow up status

One hundred and thirty-nine women presented with genital tract fistula during the period of study. We recorded successful anatomical closure in 127 patients (91.4%). Twelve (9.5%) patients who refuse to participate in the study were excluded. We recruited the remaining 115 (90.5%) patients for the study. Eight study participants (6.9%) were lost to follow up. All the remaining 107 study participants presented in person for review during the first clinic visit and at the expiration of one-year post-repair and were close and dry. We contacted the 12 patients who could not make the 2<sup>nd</sup> clinic visit on the phone.

### Sociodemographic characteristics of the participants

The mean age of patients was 28.7 years  $\pm$  7.5 (SD). Only 16.5% developed GF between ages 15 and 24 years. Eighty percent of participants belong to Yoruba. About 64% of the patients have had at least a previous failed repair, while 72% have lived with GF for at least ten years before presenting at our facility for treatment. According to Goh's classification, fifty (43.5%) of the fistula belong to Grade 1, while 52.5% of the respondents belong to a lower social class as shown in Table 1. Only 29% of the respondents who developed genital fistula from obstructed labor had antenatal care, while only 7.4% labor and deliver in the hospitals in their last pregnancy. The duration of labor among the majority (57.6%) is between 24 and 72 h, with a mean duration of 52.4 ( $\pm$  3.8) h.

### Characteristics of female genital tract fistula among the respondents

Majority of the participants (60.9%) presented with VVF only, while 10.4% and 5.2% presented with RVF only and Combined fistula (VVF and RVF) respectively. Prolong obstructed labor account for 85.9% of the GF while the remaining were iatrogenic. Twelve patients (10.4%) achieved anatomical closure of VVF following prolonged catheterization, while 89.6% became close and dry following successful surgical repair. We use the vaginal route in Sixty-eight (73.1%) of the participants who had a successful repair. None of the study participants had vascular flap repair. The surgeons use the abdominal route for the remaining participants, as shown in Table 2.

**Table 1:** Sociodemographic characteristics of the respondents.

Variables	Frequency (n=115)	Percentage (100%)
Age at Presentation (in years)		
15-24	19	16.5
25-34	50	43.5
35-44	23	20
45-50	15	13
$\geq$ 55	8	7
Mean ( $\pm$ SD)	28.7 ( $\pm$ 7.5)	
Age at onset of Fistula		
15-24	19	16.5
25-34	63	54.8
35-44	17	14.8
$\geq$ 45	16	13.9
Mean ( $\pm$ SD)	26.5 ( $\pm$ 6.9)	
Ethnicity of the participants		
Yoruba	92	80
Igbo	17	14.8
Hausa	6	5.2
Parity at the onset of Fistula		
1	56	48.7
2	43	37.4
$\geq$ 3	16	13.9
Social Class		
Upper	20	17.4
Middle	35	30.4
Lower	60	52.2
Fistula Classification		
Goh 1	50	43.5
Goh 2	34	29.6
Goh 3	20	17.4
Goh 4	11	9.5

### Urinary and sexual function scores pre- and post-anatomical closure

Sexual function was restored in 69.1% of the patients' post-closure. There was a statistically significant improvement in the Urinary Distress scores (UDUI-6 score preoperative, 16.5 (2-24), postoperative, 3 (0-24),  $P<0.001$ ; IIQ-7 score, preoperative, 25.5 (0-28), postoperative 2.7 (0-26)  $p<0.0001$ ) and incontinence impact/sexual function scores (PISQ score, preoperative, 36 (10-40), postoperative, 12 (2-25),  $p,0.0001$ ) as shown in Table 3.

### Comparison of WHOQOL-BREF parameters with average percent change in the mean values from preoperative to postoperative period

There was significant improvement in overall quality of life (preoperative score  $8.25 \pm 2.67$ , postoperative score  $93.25 \pm 7.20$ ,  $p$ -value 0.0001) as well as other domains measured as shown in Table 4

## Discussion

Globally, about 295,000 pregnancy-related death annually [1,2].

**Table 2:** Characteristics of female genital tract fistula among the respondents.

Variables	Frequency (n=115)	Percentage (100%)
<b>Types of Genital Fistula</b>		
VVF	70	60.9
RVF	12	10.4
Combined (RVF&VVF)	6	5.2
Utero-vesical fistula	15	13
Ureterovaginal fistula	8	7
Urethrovaginal fistula	4	3.5
<b>Etiologies of Genital Fistula</b>		
Prolonged obstructed labor	98	85.9
Cesarean Section (from indications other than obstructed labor)	8	6.9
Peripartum Hysterectomy	4	3.5
Elective Gynecological procedures (TAH)	5	3.7
<b>Route of surgical repair of fistula</b>		
Abdominal	29	25.2
Vaginal	73	74.8
Laparoscopy	0	0
Total	102	100

**Table 3:** Urinary and sexual function scores pre- and post-anatomical closure.

Variables	Median (Range)		Statistical Indices <sup>a</sup>
	Pre-GF Closure	Post-GF Closure	
UDUI-6	Score <sup>b</sup> 16.5 (2-24)	3 (0-24)	p<0.001
IIQ-7	Score <sup>b</sup> 25.5 (0-28)	2.7 (0-26)	p<0.001
PISQ-12	Score <sup>b</sup> 36 (10-40)	12 (2-25)	p<0.001

<sup>b</sup>Low score indicates better function. <sup>a</sup>Statistical analysis was by Mann-Whitney U-test

GF: Genital tract Fistula, Vesicovaginal fistulae; UDI-6: Urogenital Distress Inventory-6; IIQ-7: Incontinence Impact Questionnaire-7; PISQ-12: Pelvic organ prolapse/Urinary incontinence Sexual Questionnaire

For every maternal death, approximately 10 to 15 other women sustain severe morbidity, including Genital Fistula (GF) [Obstetric fistula, a disease of the under-developed nations, is a devastating condition associated with severe psychological, social, and physiological problems in the sufferer [1,2]. In developed world, female genital fistula commonly occurs following pelvic and gynecology surgeries, especially, hysterectomies. With better obstetric care and facilities, in these settings, obstetric fistula is an extremely rare event. On rare occasions, GF can occur from genital malignancies and following pelvic irradiation [4].

Larger proportion of this study participants belong to the lower social class. This further underscores the fact that GF is the disease of the poorest of the poor. This finding is similar to the results from previous studies [5,9,12].

The socioeconomic stratification tool designed by Olusanya et al. [6], combines the woman's level of education the husband's job description. This tool is appropriate for stratifying socioeconomic status in less-developed countries like Nigeria.

The higher the educational status is, the more empowered she is to seek antenatal care and opt for facility-based delivery early enough. Nigeria, being a patriarchal society, like some other African settings,

men are expected to provide for the needs of the family while women stay at home to take care of the children. A low-income father may find it challenging to provide adequate care for the woman during pregnancy. He will rather settle for cheap services rendered by the Traditional Birth Attendants (TBAs) and mission houses.

The majority of the respondents had care during their last pregnancy in mission houses and Traditional Birth Attendants (TBAs) centers. Mission houses are clinics run by churches. They offer antenatal care and deliveries, especially to low-income women. The World Health Organization (WHO) defines a traditional birth attendant as "a person who assists the mother during childbirth and initially acquired her skills by delivering babies herself or through apprenticeship to other traditional birth attendants" [13]. These sets of un-qualified care-giver contribute significantly to maternal mortality and morbidities in Nigeria and other less-developed nations [1,2].

Majority of these women labored for more than 24 h, with a mean duration of 52 h. Most of them eventually arrived too late to the health facility with a very high perinatal mortality rate. This explained why the majority of genital fistula in this study developed from prolonged obstructed labor. This fact has been corroborated by several studies in this area [5-7,14].

Iatrogenic fistula rate of 14.1% in this study is relatively high contrary to previous documentations in the developing world where iatrogenic causes account for less than 10% of the GF [14-18]. Furthermore, recent studies corroborated a gradual increase in the incidence of Iatrogenic Fistula (IF) [18,19]. Some of these procedures were carried out in government hospitals, including teaching hospitals, while the remaining were carried out in private hospitals. The root cause identified by previous studies was the surgical error or unsafe surgical technique, and they confirmed that the rate of the iatrogenic fistula is increasing. These studies concluded that an urgent look into iatrogenic fistula is needed globally [19-21].

In this series, our anatomical closure rate was 91.6%. This is within the range of 58% and 98% anatomical closure rates reported in previous survey [22-25].

This present study recorded a significant association between anatomical closure of the genital fistula and improvement in urinary and sexual function. There was also a marked improvement in the overall quality of life and perception of wellness post-closure. There is plethora of evidence on the gross outcomes of successful anatomical closure of the genital fistula and functional outcomes post-fistula closure. However, there is dearth of reports about the long-term functional outcomes of women post-closure. Flynn et al. [23], reported the gross outcomes in 40 women who had successful repairs at a 3-month follow-up. Eighty five percent reported restoration of sexual activity and 6% had voiding dysfunction at this time. Zappavigna and Herschor reported 115 women at a mean follow-up of 14.98 months (range: 1-132). Eleven women (6.96%) had urge incontinence, nine (7.83%) reported stress incontinence, 11 (9.57%) experienced urgency, 12 (10.4%) reported frequency, while a woman (0.87%) had chronic pain [24].

The reported the median UDI-6 score of 4, median IIQ-7 of 2.5, and median PISQ Score of 14 at a median of 40.5 months by Grewal et al. [25], were almost identical to that in our series. However, only 33% of their respondents had their sexual function restored despite a long follow-up period compared with 69.1% in our study. We could not ascertain the reason for this significant difference, but this may be due



**Table 4:** Comparison of WHOQOL-BREF parameters with average percent change in the mean values from preoperative to post-operative period.

WHOQOL-BREF Parameters	Pre-GF closure	Post-GF closure	P value <sup>a</sup>	Average percentage change
Overall quality of life	8.25 ± 2.67	93.25 ± 7.2	0.0001	85
Physical	15.04 ± 2.56	83.64 ± 5.09	0.0001	68.6
Psychosocial	16.42 ± 4.49	75.79 ± 6.33	0.0001	59.4
Social	51.75 ± 11.91	76.17 ± 8.53	0.0001	24.4
Environment	34.81 ± 6.89	68.88 ± 6.13	0.008	34.07

<sup>a</sup>Paired samples T-test was used to compare mean scores before and after successful anatomical closure

to cultural differences in levels of sexual activity between Americans and Africans. Furthermore, the perception of sexual satisfaction depends on the interactions among emotional well-being, intimacy with a partner, quality of life, and physical health [26]. The persistent leakage of urine, pervasive odor, perineal excoriation disrupts the women's intimate sexual relationship and, in extreme cases, leads to marital disharmony and divorce [26].

We recorded a significant improvement in the physical and psychological health domains of WHOQOL-BREF amongst women following successful repair in our study. This observation is explained by the fact that relief from persistent urinary leakage and perineal wetness brings restoration of self-esteem, improves sleep patterns, and increases work capacity. Singh et al. [26], also support this perception in their study. They noted significant improvement in the psychological and social health scores in the postoperative period. A considerable proportion of women were satisfied with their mental health after successful fistula repair. This confirms the occurrence of psychological trauma with unrepaired fistula or failed repair leading to loss of self-esteem, anxiety, and depression.

We also observed statistically significant improvement in preoperative and postoperative social health domains on the WHOQOL-BREF questionnaire. This is similar to the qualitative study findings by Alio et al. [27], where many psychological consequences like depression, a feeling of shame, and loneliness were reported. They observed social effects like isolation; rejection from the husband, which led to divorce and rejection by the society in patients with a failed repair or un-repaired Genital fistula [27].

## Study Limitations

This study used a convenient sampling technique and the sample size is small. These will make the generalizability of the result difficult. Also, recall bias is a limitation in the study. Strength: The aforementioned limitations notwithstanding, the study draws its strength from the fact that this is the first study to assess the psycho-functional impact of successful anatomical closure of female genital tract fistula among survivors in Nigeria.

## Conclusion

Genital tract fistula is still a significant public health problem, especially in the developing world. Successful anatomical closure of VVF is associated with substantial improvement and normalization of urinary function and considerable improvement in the general quality of life and sexual function score in the majority of the participants but not in all of them. It is, therefore, crucial for patient counseling to ensure that all pre-closure VVF patients are aware that while there is marked improvement in the quality of life for the majority, a few can still be very bothered by irritative lower urinary tract symptoms and reduced sexual satisfaction.

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