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ORIGINAL ARTICLE

SHORT-TERM COMPLICATIONS AND ASSOCIATED FACTORS AMONG WOMEN UNDERGOING OBSTETRIC FISTULA REPAIR AT BUGANDO MEDICAL CENTRE, MWANZA, TANZANIA

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ABSTRACT

Introduction: *Obstetric fistula is the most distressing condition in developing countries due to morbidity and loss of quality of life attributable to it. This study was conducted to determine short term complications and factors associated with these complications after repair the fistula.*

Methods: *This was descriptive follow up study conducted at Bugando Medical Centre from September 2014 to April 2015 involving 132 women with obstetric fistula and operated at the Centre. Social, demographic and clinical information were collected using questionnaires. Urine samples for culture and sensitivity were collected intra-operatively and data was analyzed using STATA version 11 software.*

Results: *The median (interquartile range) age of the participants was 23 (20-32) years. The proportion of women who developed short term complications was 42 (31.8%); with predominant complications being failed repair 18 (42.9%) and stress incontinence 10 (23.8%). Asymptomatic bacteriuria was found in 50.8% (33/65) of patients with preponderance of Gram negative bacteria. HIV seropositivity was documented in 4.1% of 123 tested patients and it was significantly associated with short term complications ($p=0.002$). Moreover, residing in rural areas ($p=0.042$); median duration of labor for more than 24 hours ($p=0.002$) with OR (95%CI) 4.38 (1.59 – 13.89), fistula type ($p =0.005$) and size ($p =0.006$), reduced bladder capacity ($p <0.001$) and urethral length ($p =0.001$) as well as presence of fibrosis ($p =0.004$) were significantly associated with short term complications among women repaired for obstetric fistulas.*

Conclusion: *The proportion of women developing short term complications at Bugando Medical Centre is high; with the common complications being failed repair and stress incontinence. The complications were associated with residing in rural areas, HIV seropositivity and fistula characteristics.*

Keywords: *Obstetric fistula repair, Short term complications, Tanzania*

INTRODUCTION

In developing countries, genital fistulas are commonly attributed to obstetric reasons as opposed to developed countries where the main causes may be related to surgical injuries (1-3). Prolonged obstructed labor remains the main cause of obstetric fistula (OF) in developing countries (4,5). WHO estimates that over two million women live with fistulae worldwide, nearly 100, 000 women are affected each year; predominantly from Sub Saharan Africa, South East Asia and South America, and this has resulted in morbidity and loss of quality of life (1,6-8). In Tanzania each year there are around 1,200 to 3,000 new cases of vaginal fistulas (9).

Surgical closure is the main therapy in OF patients and optimal fistula repair should allow for complete continence with adequate bladder capacity, normal coitus without dyspareunia, and normal reproductive ability (2,10). The complications notably stress incontinence and failed repair following surgical intervention have been variably documented; these are related to delayed timing of surgery, fistula characteristics, surgical techniques, health status of women and the infrastructures where the intervention take place (2,10-15). Moreover, the anatomical close proximity with the perianal region makes Gram negative bacteria, which are normal flora of the gastrointestinal tract ascend to the genitourinary tract and further complicate the surgical intervention (11-17).

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In Tanzania, incontinence after OF repair has been reported to be 12% and 39% at Bugando Medical Centre (BMC) and the Centre for Community Based Rehabilitation and Treatment (CCBRT) respectively (9,14). Despite this, there is limited information on the factors associated with other short term complications so as to help fistula surgeons to individualize management as well as providing prompt counseling of patients.

PATIENTS AND METHODS

Study design, site and sampling procedures: A cross-sectional descriptive study was conducted at BMC from September 2014 - April 2015 involving admitted women scheduled for OF repair; whereas women with no remaining bladder tissue to repair were excluded from the study. Using Yamane Taro formula and an average number of 197 women who were repaired for OF in the past three years; the minimum sample size was estimated to be 132 patients (18,19). Convenient sampling was done serially among patients who met the inclusion criteria until the required sample size was reached.

Data collection and laboratory procedures: Women with OF were informed in details about the aim of the study and written voluntary consent was requested from each participant. Then, a face to face interviews using the structured questionnaires and physical examination were done to get baseline social, demographic and clinical information. Provider initiated counseling and testing for HIV was done to all consenting patients by a trained nurse prior to fistula repair basing on the New National algorithm for HIV testing (20). Women found to be HIV positive were referred to the nearby Care and Treatment Clinic for further management. Other routine investigations done were hemoglobin level, blood grouping and cross matching.

Intraoperatively, fistula characteristics were assessed by the specialized fistula surgeon performing the operation and recorded. Each patient was well cleaned, draped and Havard retractor was inserted to visualize the defect; then using sterile pipette approximately 5-10 ml of urine sample was collected aseptically, transferred into sterile screw capped bottle and sent to Catholic University of Health and Allied Sciences (CUHAS) multipurpose laboratory within two hours for urinalysis, culture and sensitivity. Urine was collected from only 65 patients because in other patients, especially those with large

defect it was difficult to collect urine. All patients were surgically repaired following standard BMC protocol.

In the laboratory, urine samples were subjected to wet mount microscopy, biochemical parameters were assessed by urine dipsticks and quantitative culture was done basing on the standard microbiological procedures (21). The isolated bacteria were subjected to drug susceptibility tests by standard disk diffusion method as per Clinical Laboratory Standard Institute (22). Results of culture and sensitivity were promptly reported to the attending doctors for specific management of patients.

Following surgery, patients were reviewed every day to determine the presence of short term complications. After catheter removal (14th to 21stday), dye test was done to patients with urine leakage to assess the reason for incontinence and following this, the patients were followed until the day of discharge. Once complications were identified the patients were treated according to BMC protocols.

Data analysis: Socio-demographic and clinical data obtained in the questionnaire was entered into Microsoft excel and then exported STATA software version 11 (College Station, Texas) software for analysis according to the objectives of the study. The proportion of short term complications was determined by taking number of those who developed at least one short term complication divided by the total study population and recorded in percentages. Continuous data were described as mean (\pm standard deviation) or median (interquartile range) depending on the distribution of data. Categorical variables were described as proportion and were compared using Chi squared test or Fischer's exact test where appropriate. A p-value of ≤ 0.05 was considered as significant cut off value for various factors association with short term complications among women with repaired OF.

Ethical consideration: Approval to conduct this study was sought from the CUHAS/BMC Joint Ethical Committee (Reg. No. CREC/046/2014). Permission to conduct the study was also obtained from the Head of Department of Obstetrics and Gynecology. A written informed consent (and assent where appropriately) was obtained from each patient with OF. Confidentiality was ensured by giving anonymous codes to the study participants. Patients found to have complications were treated according to BMC guidelines.

RESULTS

Recruitment and Enrollment of patients: A total number of 227 patients with clinical diagnosis of genital fecal or urine incontinence were admitted at BMC during the study period. About 159 patients were scheduled for repair and of these 132 fulfilled the inclusion criterion (Figure 1).

Socio-demographic characteristic and birth outcome: The median (IQR) age of the patients with obstetrical fistula was 23 (20-32) years. Majority of women had primary education 91 (68.9%), married 104(78.8%), peasants 112(84.8%) and living in the rural areas 124 (93.9%). Approximately one-half of the patients had delivered once 66 (50%). The mode of delivery for most of them was caesarian delivery 78 (59.1%), and median (IQR) duration of labor was 25 (18.5-48) hours, with a range of 8 to 56 hours. The predominant birth outcome was still births in about 86 (65.1%). The median (IQR) duration of incontinence was 4 (2-10) months (Table 1).

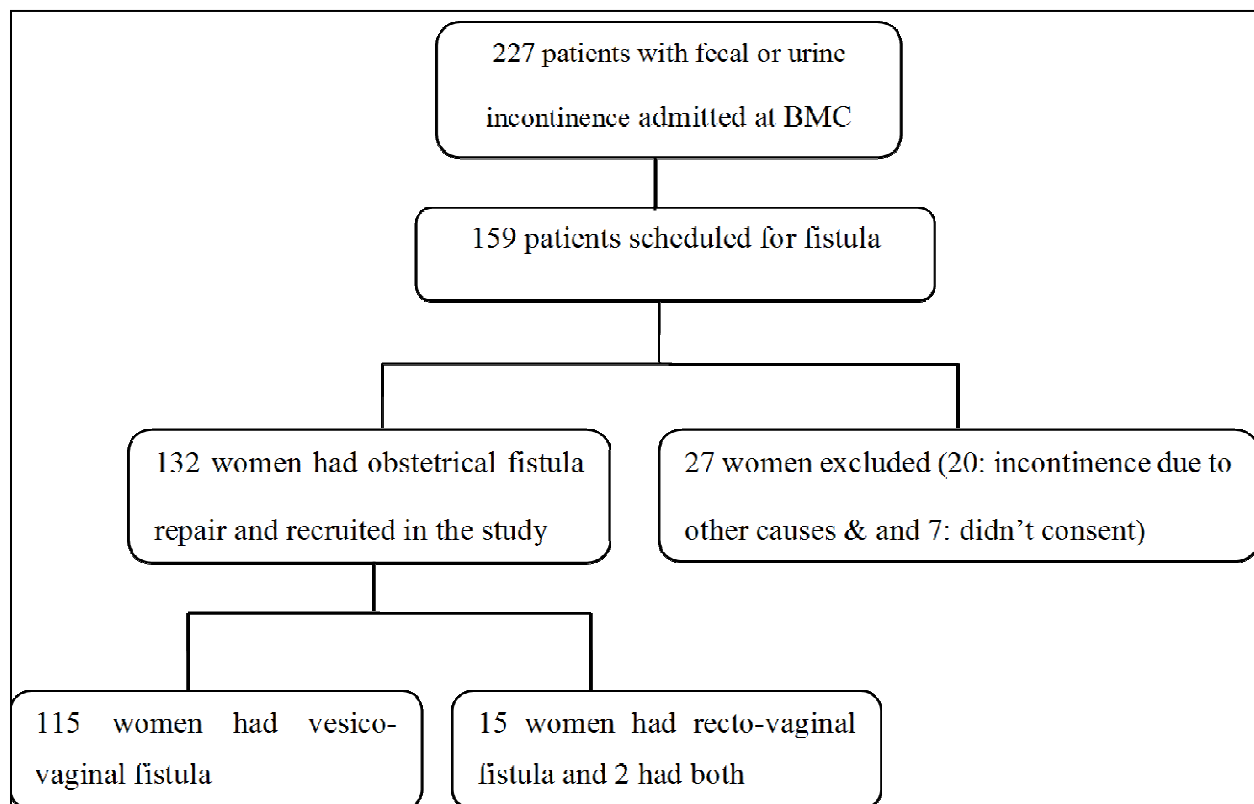


Figure 1: Enrollment of women with obstetric fistula, Bugando Medical Center, Tanzania, September 2014 - April 2015

Table 1: Characteristics of women with obstetric fistula, Bugando Medical Center, Tanzania, September 2014 - April 2015

Patient characteristic and birth outcome	Number	Percentage (%)
Age (years)		
< 20	32	24.2
20-40	93	70.5
>40	7	5.3
Education		
College and above	1	0.8
Secondary	5	3.8
Primary	91	68.9
Illiterate	35	26.5
Marital status		
Married	104	78.8
Single	18	13.6
Divorced/Separated	10	7.6
Occupation		
Peasants	112	84.8
Petty trader / Businesswoman	12	9.1
Housewife / Unemployed	7	5.3
Employed	1	0.8
Residence		
Rural	124	93.9
Urban	8	6.1
Parity		
<1	66	50.0
≥2	66	50.0
Duration of labor		
≤24	44	33.3
>24	88	66.7
Mode of delivery		
Caesarian section	78	59.1
Spontaneous vaginal delivery	50	37.9
Vacuum / Forceps	4	3.0
Birth outcome		
Stillbirth	86	65.1
Neonatal death	17	12.9
Alive and well	29	22.0

Baseline clinical characteristics and preoperative preparations: The mean (SD) body mass index (BMI) of the patients was 22.9 (\pm 2.1) kg/m² with a range of 18 to 37 kg/m². The mean (SD) preoperative hemoglobin level was 10.6 (\pm 2.1) mg/dl and the ranged was between 7.2 to 16.8 mg/dl. Of 123 patients tested for HIV serostatus, 5(4.1%) were found to be HIV positive, whereas other co morbid illnesses were found in only 2 patients (goiter and portal hypertension).

The median (IQR) duration of hospital stay before operation was found to be 6(3-10) days (range 1 to 38 days). Approximately 29(22%) of the patients had previous fistula repair, with 20(69%) being repaired once, 8(27.6%) were repaired twice and 1(3.4%) three times.

Perioperative clinical characteristics: Majority of women, 127(96.2%), had one fistula with the common sites being juxta cervical 47(35.6%) and mid vaginal 33(25.0%), respectively. In about 45(34.1%) the fibrosis was moderate to severe. Bladder capacity and urethra length were reduced in 51(43.6%) and 31 (26.5%) of these women respectively. Trans-vaginal repair was the most common surgical approach in 118(89.4%) whereas combined (trans-abdominal and trans-vaginal) surgical approaches were done in 3 (2.3%) women. During the course of the operation, skin flap was used in two patients (1.9%). Intra operatively urine was obtained for culture in 65 (62.5%) patients with vesico vaginal fistula, of these 33(50.7%) had significant bacteriuria (Table 2).

Table 2: Perioperative clinical characteristics of women with obstetric fistula, Bugando Medical Center, Tanzania, September 2014 - April 2015

Perioperative characteristics	Number	Percentage (%)
Surgical approach		
Trans vaginal	118	89.4
Trans abdominal	11	8.3
Both	3	2.3
Duration of surgery		
≤2hours	92	69.7
>2hours	40	30.3
Site of fistula		
Juxta cervical	47	35.6
Mid vaginal	33	25.0
Juxta urethra	13	9.9
Recto vaginal fistula	15	11.4
Uretero vaginal fistula	11	8.3
Circumferential	11	8.3
RVF and urinary fistula	2	1.5
Fibrosis		
Mild	87	65.9
Moderate	36	27.3
Severe	9	6.8
Bladder capacity**		
Normal	66	56.4
Reduced	51	43.6
Urethra length**		
Normal (>3cm)	86	73.5
Reduced	31	26.5
Intra operative urine culture [‡]		
Significant bacteriuria	33	50.8
Non significant bacteriuria	32	49.2

** Recto vaginal fistula and ureteric fistula not included

Bacterial isolates: Significant asymptomatic bacteriuria was found in 33(50.7%) giving a total of 43 bacterial isolates. Gram negative bacteria predominated, 93% (40/43). The most common bacteria

were *Klebsiella* spp 9(20.9%), followed by *Escherichia coli* 8(18.6%) and *Pseudomonas aeruginosa* 7(16.3%). Ten patients had two bacteria isolates each (Table 3).

Table 3: Bacteria isolates from women with obstetric fistula, Bugando Medical Center, Tanzania, September 2014 - April 2015

Bacteria species	Number	Percentage (%)
<i>Klebsiella</i> spp*	9	20.9
<i>Escherichia coli</i>	8	18.6
<i>Pseudomonas aeruginosa</i>	7	16.3
<i>Proteus</i> spp	3	7.0
Other Gram negative bacteria***	7	16.3
Unidentified Gram negative bacteria	6	13.9
Gram positive bacteria [‡]	3	7.0
Total	43	100

* *Klebsiella pneumoniae* (6) and *Klebsiella oxytoca* (3)

** *Proteus mirabilis* (2) and *Proteus vulgaris* (1)

****Pantoea agglomerans* (4), *Citrobacter freundii* (2) and *Morganella morganii* (1)

[‡]*Staphylococcus aureus* (1), *Streptococcus viridians* (1), *Group A Streptococcus* (1).

Drug susceptibility patterns of bacteria isolates:

There was high rate of resistance to Amoxicillin-clavulanate (75%-100%), Ceftriaxone (50%-70%) and Cotrimoxazole (66.7%-87.5%) among Gram negative bacteria. Variable resistance patterns to Gentamicin (16.7%-80.0%) and Ciprofloxacin (33.3%-50.0%) were noted. Moreover, there was low level of resistance to Nitrofurantoin (0.0%-33.3%), Piperacillin-tazobactam (0.0%-14.3%) and Imipenem (0.0%) to Gram negative bacteria.

Types of short-term postoperative complications:

Short term complications were found in 31.8% (42/132) of all patients. Nine patients (21.4%) had

multiple complications. The predominant short term complications were failed repair in 18(42.9%) and stress incontinence in 10(23.8%). Peritonitis complicated in one patient who had juxta cervical fistula and was repaired using combined trans vagina and trans abdominal surgical repair (Table 5). None of the patients with recto vaginal fistula was found to have short term complication. Among the patients with ureteric injury 1(9.1%) had abdominal wound infection. Short term complications were also observed in 14(42.4%) of those with significant asymptomatic bacteriuria.

Table 4: Types of short-term complications among women with obstetric fistula, Bugando Medical Center, Tanzania, September 2014 - April 2015

Short term post operative complication	Number	Percentage (%)
Failed repair only	18	42.9
Stress incontinence only	10	23.8
Hemorrhage only	2	4.8
Others*	3	7.1
Multiple complications**	9	21.4
Total	42	100

* Urine retention (1), surgical site infection (1), retained catheter (1)

**Stress incontinence & surgical site infection (3), stress incontinence & failed repair (1), failed repair & hemorrhage (1), stress incontinence & hemorrhage (1), stress incontinence, hemorrhage & failed repair(1), failed repair & ureter blockage (1), hemorrhage & peritonitis (1).

Factors associated with short term complications:

The factors which were significantly found to be associated with short term complications included living in rural areas (p= 0.042), median duration of labor for more than 24 hours (p=0.002) with OR (95%CI) 4.38 (1.59–13.89), women who had still-birth (p<0.001) and women with HIV infection (p=0.002) (Table 5).

Peri operative factors and fistula characteristics:

The fistula site, type, size and the presence of fibrosis (p values=<0.001, 0.005, 0.006 and 0.004 respectively) were significantly associated with short term complications. Reduced bladder capacity and urethra length were also significantly associated with short term complications with p values of <0.001 and 0.001 respectively (Table 6).

Table 5: Association of socio-demographic characteristics, birth outcomes and HIV with short term complications among women repaired for obstetric fistula, Bugando MC, Tanzania, Sept. 2014 - Apr. 2015

Predictor variable	Short term complications [‡]		Chi 2	p value
	Yes n (%)	No n (%)		
Age*	23 (20-31)	23 (19-32)	-	0.7448
Education				
College and above	0 (0.00)	1 (1.11)		
Secondary	2 (4.76)	3 (3.33)	-	0.513
Primary	32 (76.19)	59 (65.56)		
None	8 (19.05)	27 (30.00)		
Marital status				
Married	34 (80.95)	70 (77.78)		
Single	5 (11.9)	13 (14.44)	-	0.942
Divorced/Separated	3 (7.14)	7 (7.78)		
Occupation				
Peasants	35 (83.33)	77 (85.56)		
Petty trader / Businesswoman	6 (14.29)	6 (6.67)		
Housewife / Unemployed	1 (2.38)	6 (6.67)	-	0.368
Employed	0 (0.00)	1 (1.10)		
Residence				
Rural	42 (100.00)	82 (91.11)		
Urban	0 (0.00)	8 (8.89)	-	0.042
Duration of labor				
≤24	6 (14.29)	38 (42.22)		
>24	36 (85.71)	52 (57.78)	10.0571	0.002
Birth outcome				
Stillbirth	36 (85.71)	50 (55.56)		
Neonatal death	6 (14.29)	11 (12.22)	-	<0.001
Alive and well	0 (0.00)	29 (32.22)		
HIV infection				
Reactive	5 (11.90)	0 (0.00)		
Non reactive	36 (85.71)	82 (91.11)	-	0.002
Unknown	1 (2.38)	8 (8.89)		

[‡] Composite variable

Table 6: Association of fistula characteristics and intraoperative findings with short-term complications among women repaired for obstetrics fistula, Bugando Medical Center, Tanzania, September 2014 - April 2015

Predictor variable	Short term complications [‡]		Chi 2	p value
	Yes n (%)	No n (%)		
Previous repair				
Yes	13 (30.95)	16 (17.78)	2.8994	0.089
No	29 (69.05)	74 (82.22)		
Fistula site*				
Juxta urethra	6 (14.29)	7 (7.78)	-	<0.001
Circumferential	9 (21.43)	2 (2.22)		
Mid vagina	8 (19.05)	25 (27.78)		
Juxta cervical	17 (40.48)	30 (33.33)		
RVF and urinary fistula	1 (2.38)	1 (1.11)		
Uretero vagina	1 (2.38)	10 (11.11)		
Recto vagina	0 (0.00)	15 (16.67)		
Fistula type				
Urinary fistula	41 (97.62)	73 (81.11)	-	0.005
Recto vaginal fistula	0 (0.00)	15 (16.67)		
Both	1 (2.38)	2 (2.22)		
Fistula size(cm)***				
≤3	25 (60.98)	55 (84.62)	7.5897	0.006
>3	16 (39.02)	10 (15.38)		
Fibrosis				
No fibrosis	20 (47.62)	67 (74.44)	10.8101	0.004
Moderate	16 (38.10)	20 (22.22)		
Severe	6 (14.29)	3 (3.33)		
Bladder capacity*				
Normal	13 (30.95)	53(70.67)	26.2151	<0.001
Reduced	29 (69.05)	22 (29.33)		
Urethra length(cm)*				
<3	19 (45.24)	12(16.00)	11.8177	0.001
Normal	23 (54.76)	63 (84.00)		
Intra operative urine culture**				
Significant bacteriuria	14 (58.33)	19 (46.34)	0.8710	0.351
Non significant bacteriuria	10 (41.67)	22 (53.66)		

[‡] Composite variable

*Recto vaginal fistula and ureteric fistula not included

** Urine samples collected in 65 patients with vesico vaginal fistula only

*** UVF and RVF not included

DISCUSSION

The magnitude and types of short term complications: The present study showed that the proportion of women who got short term complications after OF repair was 31.8%. This prevalence is high compared to the study which was done at BMC (16%)(14). The reason of high prevalence may be due to the fact that the present study evaluated many short term complications

compared to the previous study. It could also be related to the fact that the present study included patients operated for the first time as well as those with previous repair (6,23). Similarly, the results in the present study were not different from what was found in other studies in the same country, Liberia, Uganda and Zambia, where the proportion of women developing complication ranged from 12% to 39% (9, 24-26). The reason behind these similarities may be related to the study settings characterized by limited resource, poor infrastructure, and same fistula development mechanisms. Similar to other studies in

Tanzania, Kenya, Uganda, and Liberia, the present study has shown that the main short term complications are failed repair and stress incontinence (12,14,25).

Factors associated with short term complications: In this study majority of women were in the reproductive age, had primary school education, peasants, living in rural areas and they were married. Similar observations were seen in previous studies (9,14,25,26). It is well known that women living in the rural areas lack emergence obstetric care facilities and therefore more likely to succumb from these complication. This reiterates the need to strengthen emergence obstetric services in rural areas.

Moreover, the present study also indicates that women with history of poor birth outcomes; notably stillbirths and neonatal deaths were more likely to get short term complications. These adverse perinatal outcomes emphasizes on the need to strengthen the maternal and child health care services in the rural areas.

HIV positive had strong association with occurrence of complications, with all 5 (100%) HIV patients developing short term complications; one of them developed peritonitis post vesico-vaginal fistula (VVF) repair. This is different from what was found from the study in Cameroon where there was no difference in outcome between the two groups (15) and in the light of these, a large study is needed to compare and ascertain the findings.

Fistula type was another factor associated with short term complications; those with recto vaginal fistula and ureteric fistula had the least complications compared to those with VVF and this is comparable what was found previously in Tanzania and Uganda (14, 25). Majority of patients with circumferential fistula and those with fistula size of >3cm had complications and this is similar from previous studies (12,25-27). Reduced urethral length, bladder capacity and fibrosis were also found to be associated with short term complication as found by other researchers in the previous studies elsewhere (12,25,28-30). These can be attributed to difficult in tissues mobilization and hence complications. In the light of these findings, fistula surgeons in this setting should carefully assess these factors and tailor relevant surgical interventions to ensure best outcome.

Study limitation: Due to small sample size; predictors of short term complications were not subjected to multivariate analysis and as matter of fact a long term study should be conducted to further delineate the contribution of each variable into short term complication.

Conclusion: The prevalence of short term complications among patients undergoing OF repair at BMC is high (31.8%); with the common complications being failed repair, stress incontinence and hemorrhage. Residing in rural areas, history of poor birth outcome, HIV seropositivity and fistula characteristics were significantly associated with short term complications among women repaired for OF.

Knowing the factors associated with short term complications among women with OF will be crucial in selection as well as optimization of surgical intervention. Obstetric fistula remains to be a significant morbidity even after repair so the measures to prevent occurrence of these fistula should continue to be emphasized.

Authors' Contributions: KTM, JS and RR conceived, designed and executed the study; KTM, ANM, BG and RNR managed the patients; KTM, JS and RNR analyzed the data; JS wrote the first draft of the manuscript which was critically reviewed by all authors. All authors have read and approved the final draft of the manuscript.

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