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Factors Influencing Post-Operative Short-Term Outcomes of Vesicovaginal Fistula Repairs in a Community Hospital in Liberia

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Abstract

Objectives—To assess factors influencing short-term outcomes of vesicovaginal fistula (VVF) repairs in community-dwelling women of Liberia, Africa.

Methods—Forty patients who underwent VVF repairs were analyzed. Primary outcome was continence status at 14 days post repair. Factors influencing continence status were characterized.

Results—The mean duration of leakage was 9.6 ± 8.3 years, (3 months–28 years). Thirteen (33%) had previous repairs, and 6 (15%) had multiple fistula sites. Twenty-eight (70%) were continent at catheter removal. First time repairs had a higher continence rate compared to women with previous repairs, 78% and 54% respectively ($p = 0.15$). Seven (47%) juxtaurethral repairs were considered failures, while only one (9%) juxtacervical fistulas remained incontinent ($p = 0.069$). Controlling for duration of leakage, women with previous repairs were significantly less likely to be continent ($p = 0.04$; adjusted OR = 0.07; 95% CI: 0.005, 0.83).

Conclusions—Patients with previous VVF repairs and juxtaurethral fistulae experience lower success rates; surgery remains an effective treatment for many VVF patients.

Keywords

Incontinence; VVF; Vesicovaginal; Fistula; Africa

Introduction

Obstetric fistulae are a known and debilitating complication of obstructed childbirth, and can lead to social isolation. With medical advancement and access to emergency healthcare, obstetric fistulae are almost nonexistent in developed nations; however, they continue to be

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a source of significant suffering for families in the developing world, particularly in the uneducated and poor [1, 2]. The incidence of VVF is unknown in developing countries due, in part, to poor record-keeping. Estimates of 50,000 – 100,000 new fistula cases per year have been reported from several African countries where large, dedicated VVF centers exist [3]. A conservative estimate reports that 3.5 million women in the developing world have unrepaired obstetric fistulae [4] and no published reports on post-operative outcomes of fistula repairs have been identified from Liberia.

Liberia has suffered through nearly 20 years of civil war that has markedly impacted its health care infrastructure and resources, and is now heavily dependent on foreign aid. There are an estimated 103 Liberian physicians to care for the country's 3.5 million people. Most physicians in Liberia are expatriates working with various humanitarian, nongovernmental organizations or with the United Nations [5, 6].

As a result of limited health care resources in Liberia, fistulae remain a common complication of obstructed childbirth. Like many in developing countries of Africa, Liberian women may suffer with untreated vesicovaginal and rectovaginal fistulae for years. From limited data in other African countries, surgical success is reported to be between 72 to 92%, with greater success for first time repairs and in those with minimal scarring at the time of repair [7–9]. Unfortunately, the difficulty of post-operative follow-up, as well as financial constraints in these rural areas, results in few long-term outcome data on post surgical VVF repair. In this report, our goal was to assess peri-operative and patient characteristics—such as fistula location, duration of leakage, previous repairs, use of peri-operative antibiotics, and duration of leakage—that may influence short-term outcomes of obstetric VVF repair in rural Liberia.

Study design, materials and methods

All women in this study underwent surgery at Ganta United Methodist Hospital (GUMH), drawn by public service radio announcements as well as other communication efforts made prior to the surgical team's arrival. Temporary medical licenses were obtained from the Liberian Medical Board, and permission to conduct our research was obtained by GUMH's administrators. Institutional Review Board committee approval was obtained from the University of Alabama at Birmingham. Data were collected from operations performed during two surgical mission trips, in June 2008 and January 2009. Retrospective chart reviews were performed on patients treated in June, 2008 and prospectively reviewed in patients undergoing fistula repair in January, 2009. Patients from Liberia and bordering Guinea were evaluated sequentially based on arrival at the hospital. A thorough history and physical examination were performed with assistance and translation from an experienced nurse trained to care for VVF patients. Individuals with a fistula diagnosed by physical examination were scheduled for repair and included in the study. The preoperative physical examination included adjunctive testing such as localization of the fistula using methylene blue stained saline. In several patients being evaluated where clinical history was suspicious for stress urinary incontinence, detrusor over activity and/or small capacity bladder, simple cystometrics were performed to further evaluate bladder function, if a fistula was identified in those women, this did not alter their treatment. Women were hospitalized for evaluation and surgical planning. Spinal anesthesia and mild sedation were administered at the time of surgery by anesthesia staff. Most patients underwent a transvaginal approach in steep Trendelenburg position, using wide mobilization with a 2-layer bladder closure in the majority of cases. A complete 2-layer closure was not possible in cases where the tissue had severe scarring from previous repairs. Foley catheters were removed 14–16 days post operatively.

Parameters analyzed for association with VVF repair outcomes included patient demographics (e.g. age at the time of presentation, parity, duration of labor, delivery method [Cesarean versus vaginal delivery], and duration of leakage [Table 1]), and peri-operative factors (e.g. use of perioperative antibiotics, preoperative hemoglobin, fistula location, fistula size and surgical approach [Table 2]). The surgical approach and need for Martius flap were determined from the physical examination, primary surgeon's experience, and type of fistula. The primary outcome of interest was continence status immediately following removal of the foley catheter 14–16 days post-surgical repair. Continence was defined as being completely dry by patient report after catheter removal.

Data was obtained by pre- and post-operative chart review and extraction from the extensive paper medical records maintained by the hospital and primary fistula patient nurse. Patient characteristics were compared for those determined to be continent vs. not continent. For quantitative measures, independent sample t-tests were used to test equality of means and results are presented as mean $\pm$ SD. Where appropriate, Wilcoxon rank-sum tests were used to test equality of medians and results are presented as median (range). Fisher's exact test was used to test independence between the primary outcome and categorical measures of patient characteristics and the surgical procedure. Multivariable logistic regression was used to evaluate the effects of specific characteristics of interest (prior surgical history and surgical location) on the primary outcome while controlling for covariates. SAS 9.2 (SAS Institute, Cary, NC) was used for all analyses and statistical significance was defined as a p-value <0.05 . All hypothesis tests were 2-sided.

Results

Forty subjects underwent VVF repair during the 2 surgical missions and are considered in the analysis. Thirty-nine patients sustained fistulae as a result of obstructed labor. One patient with no history of labor had a fistula as a result of an abdominal hysterectomy for a benign condition. The mean $\pm$ SD and age range of study participants was 38 ± 16 years, (16–70). Based on the available medical records, the mean duration of labor was 3.2 ± 2 days (0.5–9 days, $n = 39$) and the mean duration between start of current leakage and repair was 9.6 ± 9.3 years (3mo–28y, $n = 28$). Method of delivery was recorded for 39 women and 23 (59%) had C-sections following admission to a hospital for obstructed labor. Fistula size was recorded for 20 women with an average VVF size of 1.77 ± 1.1 cm (0.3–4 cm). The remaining twenty (50%) women did not have the exact fistula size recorded during the repair. The mean preoperative hemoglobin was 11.3 ± 1.6 mg/dL (7.3–14 mg/dL, $n = 37$). Twenty-eight patients (70%) were continent when catheters were removed (14–16 days after VVF repair). There were no differences in patient characteristics between continent and incontinent patients [Table 1].

Juxtaurethral ($n=15$) and juxtacervical ($n=11$) were the most common fistula locations, cumulatively accounting for 65% of our observed fistulae. Two patients (5%) also had concomitant rectovaginal fistula (RVF). Six (15%) women had multiple fistula sites. Thirteen individuals (33%) had previous attempted VVF repairs [Table 2] and 4 (10%) had more than one previous repair. Treatment included: 24/40 (60%) vaginal VVF repairs, 10/40 (25%) vaginal VVF repairs with Martius flap, and 6/40 (15%) abdominal VVF repairs. Twenty-seven patients (70%) received perioperative antibiotics as recorded in the medical record.

All patients were counselled that subsequent deliveries should be via planned Cesarean delivery to protect the fistula repair. Interestingly, one patient was in her first trimester of pregnancy during her fistula repair in June of 2008, which was unknown to the surgeons at that time. She had a subsequent vaginal delivery, and remained continent post delivery, as confirmed by a follow-up visit in January of 2009.

None of the covariates analyzed in this study demonstrated a significant association with continence status; however, some trends were noted. Women with first time repairs had a higher continence rate (78%) compared to women with a history of a previous repair (54%, $p = 0.15$). Efficacy of the repair appeared to depend on the location of fistula, with 9% (1/11) of subjects having juxtacervical fistulae repairs remaining incontinent at 14 days, compared to (7/15) 47% of subjects undergoing juxtaurethral fistula repairs ($p = 0.08$). There was also a trend towards a statistical difference in the duration of leakage between incontinent and continent subjects ($p = 0.07$). Adjusted logistic regression models examining the effects of multiple repairs and fistula location were performed. Controlling for duration of leakage, women with previous fistula repairs were significantly less likely to be continent at 14 days post repair ($p = 0.04$; adjusted OR = 0.07; 95% CI: 0.005, 0.83). In a similar covariate-adjusted model, patients with juxtaurethral repairs were less likely to be continent than those with juxtacervical repairs ($p = 0.08$; adjusted OR = 0.07; 95% CI: 0.004, 1.37). The small sample size restricted our ability to consider models adjusted for multiple covariates.

Finally, surgical approach appeared to have no effect on the outcome. Complete data on fistula size and degree of scarring/fibrosis were not available for inclusion in the analysis.

Discussion

Our study showed a decreased success in patients with previous repairs, multiple fistula sites, and juxtaurethral fistula location. This trend is consistent with previous reports. A large fistula series from Sierra Leone reported a 92% and 63% success with midvaginal and juxtaurethral fistulae respectively, with a 73% versus 27% success rate in primary and secondary repairs respectively. Few other studies have included patients undergoing second repairs in their outcome analysis [8].

The subjects of this study are somewhat unique as most suffered prolonged leakage and one-third had undergone previous VVF repairs [2]. Although none of the variables of interest were significantly associated with continence status 14 days after surgery in univariate analyses, our observational study was limited by sample size and completeness of the data. However, some variables are noteworthy as their association with continence status approached statistical significance. Juxtacervical fistula repairs appear to have better outcomes than the other fistula locations and secondary repairs are less likely to be successful as noted by multivariable logistic regression analysis. These results corroborate other reports [1, 10] and in the case of location of fistulae, may reflect the potential ability in general to more fully mobilize and obtain tension-free closures with juxtacervical repairs as compared to juxtaurethral repairs [7, 8]. Further, secondary repairs are inherently more difficult from increased scarring associated from previous surgery [1, 8, 10]. The overall short-term fistula repair success rate of 70% is at the lower end of reported success rates for obstetric fistula [11–13]. The number of patients with multiple fistulae, juxtaurethral location and previous repairs, however, are higher in our population than most studies and may contribute to the overall decreased success rate [7]. Importantly and unfortunately, there was no distinction between stress urinary incontinence (SUI) and persistent fistula at the 14-day endpoint as the cause of leakage, which may have affected the fistula repair success rate as well. Previous reports have reported a urethral incontinence rate of 17–24.3% of VVF cases [1, 7, 10, 14] and Lewis reported a 10% prevalence of SUI after VVF repair [8].

This study focused on factors affecting short-term surgical outcome because it is an important initial endpoint that can assist in surgical planning. Assessing long-term success is also important in planning medical intervention, but is difficult to do in this population because of the large geographic area served and the lack of resources for adequate follow up. The few studies that have reported longer-term follow-up may be limited by the biases inherent in which patients return. Although difficult to interpret due to incomplete follow-up

data, one report described a 15.6% new urethral incontinence rate and 4% “late breakdown” of the fistula 6 months after VVF repairs [14].

Despite the inherent limitations associated with the retrospective analysis of this small population sample, these results may encourage fistula surgeons to more fully characterize patients and help understand those characteristics that may influence short-term outcomes and subsequent longer-term benefits. The limitations of collecting data in an environment where medical care is not consistently available and patients travel from remote locations for surgery are numerous. The limitation of the surgeons’ time on site sometimes forces them to rely on the nursing and other medical staff for post operative foley removal and postoperative assessment of continence status. The lack of a thorough physical examination sometimes prevented the discrimination of urinary incontinence from urethral incompetence versus persistent fistula. Patients may have had a urinary tract infection contributing to incontinence symptoms. Further objective evaluation such as the use of a pad test would be ideal, however, is rarely performed due to a lack of resources. Programs directed toward overall access to care are greatly needed, and would ameliorate the suffering and shame of women already suffering from this physically and socially debilitating condition.

Conclusion

Although patients with previous VVF repairs experience a lower continence rate than patients with primary VVF repairs, our study suggest that surgery is an effective treatment. Larger prospective studies with consistent follow-up will help us to more fully understand those factors associated with short and long term treatment success.

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Table 1

Patient Demographics- The p-value reflects tests of equal means using independent sample t-tests (unless otherwise noted)

Characteristic	Total patients (n=40)	Continent after surgery (n=28)	Not continent after surgery (n=12)	p-value
Age mean±SD (range) years	38 ± 16 (16–70)	40.5 ± 17 (17–70)	33 ± 12.5 (16–60)	0.19
Term Deliveries median (range)	3 (0–18)	4 (0–18)	1.5 (1–13)	0.27*
	Total patients (n=39)	Continent (n=27)	Not continent (n=12)	p-value
Duration of Labor mean±SD (range) days	3.2 ± 2 (0.5–9)	3.2 ± 2.2 (0.5–9)	3.3 ± 1.6 (1–7)	0.95
Delivery Method N (%)				
C-Section	23 (59%)	15 (56%)	8 (67%)	0.73
Vaginal	16 (40%)	12 (44%)	4 (33%)	
	Total patients (n=37)	Continent (n=26)	Not continent (n=11)	p-value
Pre op Hbg (mg/dl)	11.4 ± 1.6 (7.3–14)	11.2 ± 1.7 (7.3–14)	11.7 ± 1.4 (8.7–13)	0.45
	Total patients (n=28)	Continent (n=19)	Not continent (n=9)	p-value
Duration of Leakage mean±SD (median, range) years	9.6 ± 8.3 (0.3–28)	11.8 ± 9 (12, 0.3–28)	5.1 ± 3.9 (4, 0.6–7)	0.07*
	Total patients (n=20)	Continent (n=16)	Not continent (n=4)	p-value
Fistula Size Mean± SD Range (cm)	1.8 ± 1.1 (0.3–4)	1.6 ± 1.1 (0.3–4)	2.4 ± 1.1 (1–3.5)	0.22

* Wilcoxon Rank-Sum test

Table 2

Perioperative Factors and Surgical Success- Tests of significance reflect Fisher's exact test

Variable	Number of Patients (%)	Successful Surgery % (n)	p-value
VVF History, N(%)			
First VVF	27 (67.5)	78 (21)	0.15
Secondary VVF	13 (32.5)	54 (7)	
Repair Type, N(%)			
Vaginal	24 (60.0)	75 (18)	0.49
Vaginal Martius	10 (25.0)	70 (18)	
Abdominal	6 (15.0)	50 (3)	
Fistula Location, N(%)			
Juxtaurethral	15 (37.5)	53 (8)	0.07
Juxtacervical	11 (27.5)	91 (10)	
Circumferential	4 (10.0)	75 (3)	
Urethral	2 (5.0)	0	
Mid vaginal	6 (15.0)	83 (5)	
Vesico-uterine	2 (5.0)	100 (2)	
Perioperative Antibiotics, N(%)			
Yes	27 (67.5)	67 (18)	0.72
No	13 (32.5)	77 (10)	
Multiple Fistulae, N(%)			
Yes	6 (15.0)	50 (3)	0.34
No	34 (85.0)	74 (25)	
Delivery Method, N(%)			
Vaginal	16 (41.0)	75 (12)	0.72
Cesarean	23 (59.0)	65 (15)	