Outcome of using a modified surgical technique for the repair of complex vesicovaginal fistulas in Nigeria

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Abstract

The relatively low effectiveness of available surgical repair techniques for complex obstetric fistula has justified the need for continued exploration of more effective repair techniques. Subjects who presented at a vesicovaginal fistula referral centre in Nigeria were randomized into the study group (modified technique) and the control group (conventional technique). Success rates between the two groups were compared. The study comprised 29 patients in each arm of the study. The mean age of patients in the study group was 23.9 ± 9.6 years and 24.4 ± 2.1 years among patients in the control group with the vast majority of the patients in the both groups being married, 75.9% and 86.2% respectively. In both groups, the majority were secundipara, 55.2% in the study group and 44.8% in the control group. The majority (41.4% in the study group and 44.8% in the control group) of the patients in both groups had attained primary level of education. The mean duration of the fistulas among patients in the study population was 1.1 ± 0.3 years with over half (50.0% among patients in the study group and 53.5% of patients in the control group) of the patients had their fistula for less than one year. A highly statistically significant difference in success rate between patients in the study group and patients in the control group was obtained (p=0.0004). The modified repair technique presented by this study has proved to produce superior results when compared to the conventional repair technique in the management of complex obstetric fistulas in Nigeria.

Introduction

Vesicovaginal fistula (VVF) resulting from prolonged obstructed labour continue to occur in low resource countries like Nigeria due to socioeconomic deprivation of the populace and inadequacy of maternity care services.[1,2]

Nigeria's position as the most populous country in Africa carries with it the notoriety of having the largest number of vesicovaginal fistula patients in the world. With a prevalence of 400,000 to 800,000 women living with vesicovaginal fistula and an incidence of 20,000 new cases annually, the magnitude of the menace is not only huge but carries the potential of escalating over time.[1,3]

At present in Nigeria, efforts targeted at eradication of this scourge is not concerted, budgetary provision is abysmal and never gets to the end-users and dedicated VVF centres are far apart and poorly equipped.[1,4] With the dearth of trained VVF surgeons and the slow rate of repair, eradication of this scourge is not feasible in the near future.[4,5] The prospect of eradicating VVF is rather gloomy considering the fact that measures have not been put in place to eliminate the occurrences of new cases.

Vesicovaginal fistula, which is characterized by involuntary leakage of urine is devastating to the health of affected women with attendant disruption of their physical, social and mental health as well as their environment.[5] The eradication of this menace in a country like Nigeria, where it is endemic requires concerted effort with innovative strategies targeted at all-three levels of prevention- primary, secondary and tertiary.[6]

While government, medical and health workers as well as other relevant stake holders have roles to play in the primary and secondary levels of prevention of the occurrence of especially obstetric fistula, the VVF surgeon is primarily preoccupied with prevention at level three- successful fistula repair.

This research was conducted in order to explore a way of increasing success rate following repair of complex vesicovaginal fistula in a dedicated vesicovaginal fistula repair centre in Nigeria. The justification of this study is the fact that at present, success rate following repair ranges between 75.0 to 88.0% in series where patient selection based on available level of surgical expertise were not performed before repair, and prognosis of vesicovaginal fistula worsens with repeated failed attempts at repair.[4,6-8] We hope that the results of this study would make its contribution to the efforts targeted at reducing the burden of obstetric fistula in the world.

Materials and Methods

Study design and study area

This was a case-control study where patients with complex obstetric fistulas were matched based on socio-demographic characteristics and randomized into the study group, where a modified repair technique was used in fistula repair and the control group, where the conventional repair technique was used to repair the fistulas at the Family Health Centre, Akwa Ibom State, Nigeria. The Family Health Centre is a dedicated maternal injury health facility located in the Southeast health zone of Nigeria.

The Family Health Centre is a referral centre for all cases of maternal injuries like episiotomy breakdown, perineal laceration, genital prolapse, vesicovaginal fistula and rectovaginal fistula as well as other types of genitourinary fistula in Akwa Ibom State and the neighbouring states of Abia, Cross River, Imo, Rivers and Bayelsa.

The Family Health Centre is located at Mbribit Itam in the outskirts of Uyo, the

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Key words: Obstetric fistula; surgical repair; modified technique; success rate; Nigeria.

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state capital of Akwa Ibom State, one of the 36 states of the federal republic of Nigeria, located in the South-south geopolitical zone of the country. The states in this catchment area all have similar sociocultural and traditional practices with less than 50% of the women having attained at least secondary level of education.[2] In spite of several health facilities distributed across the states, only 61% of pregnant women obtain antenatal care, a mere 36% deliver in health facilities, while only 38% deliver under skilled attendance.[2] The majority of the women, especially those living in rural areas for various reasons prefer to deliver in traditional birth attendants' homes and other unlicensed maternity centres where intrapartum care may be suboptimal.[2]

Recruitment and data collection

Following approval from the Ethical Committee of the Family Health Centre, all the 140 women who presented with different degrees of obstetric fistula during the 2 year period of the study were screened using the prognostic scoring system proposed by Umoiyoho and Inyang-Etoh.[4] Sixty complex cases were identified but 58 met the inclusion criteria and were recruited into the study. Using the prognostic scoring system proposed by the Authors as a guide to patient selection for VVF repair based on fistula complexity and available surgical expertise,[4] patients whose scores were 4 or less were classified as simple cases and excluded from the study.[4] Patients who met the inclusion criteria were 58 and included those who scored 5 and above over 29, but excluded two patients who had exceptionally high risk factors.[4] These two patients were not recruited into the study because they had VVF with either involvement of the urethra with circumferential defect or total urethral loss. The simple cases that were excluded from the study were repaired using the conventional technique, while the patients with exceptionally high risk factors were reserved for a visiting multidisciplinary expert surgical team.

The 58 patients with complex fistulas who met the inclusion criteria were counselled on the nature of the study and informed that participation was voluntary and that information obtained shall be handled with a high level of confidentiality. They all consented to participate in the study, so informed consent was obtained from each of them before surgical intervention. Patients in the study population were categorized based on their age, parity, duration of fistula and fistula characteristics and randomized into the study group and control group using a simple random sampling technique. The data generated were analysed using descriptive and inferential statistics. The success rate of repair between the modified repair technique and conventional repair technique were compared using the Student t-test, a test statistic was computed and a p-value of 0.05 was considered significant. The results are presented in tabular form and the success rate of repair between the two groups is also presented on a line graph.

Surgical repair techniques

Conventional repair

In the control group where the conventional technique of repair of the fistulas was used, the patients were placed in the exaggerated lithotomy position under saddle block regional anaesthesia and routine vulval and vaginal preparation, as well as draping were performed; the fistula opening in the anterior vaginal wall was identified. The edge of the fistula opening was mobilized and the edge resected through to the urinary bladder wall. The vaginal wall was then incised longitudinally through the opening. Next, the bladder wall was identified, dissected and separated from the vaginal wall for up to 2cm around the fistula. Any remaining scar tissue around the fistula was then excised. Interrupted stitches were placed around the edges of the bladder wall starting from the 3 o'clock position using polyglactin, size 2/0 on an atraumatic needle. These stitches were then tied separately invaginating the mucosa towards the bladder cavity. A second layer of repair was then performed with interrupted sutures of polyglactin, size 2/0 across the defect in a manner so as to bury the first layer taking care not to allow the sutures breach the bladder mucosa. The vaginal wall was then closed using interrupted mattress stitches of polyglactin, size 2/0 on an atraumatic needle. Haemostasis was attained.

All the repairs were performed by the lead Author, who is a trained VVF surgeon and the postoperative management followed an established protocol by dedicated nurses who have been trained to proficiency in the postoperative care of VVF patients. Test for urine leakage was through the continence dye test, which was performed on each patient on days 7, 10, 12, 14, and 21 with aqueous solution of methylene blue. For the purpose of this study, the urethral catheter was maintained for 21days for continuous bladder drainage. Postoperative review and certification of cure was performed at 6weeks.

Modified repair

In the modified repair technique, the approach to repair was similar to the conventional technique, save for the introduction of a third layer of repair. The edge of the fistula opening was mobilized and the edge resected through to the urinary bladder wall. The vaginal wall was then incised longitudinally through the opening. Next, the bladder wall was identified, dissected and separated from the vaginal wall for up to 2cm around the fistula. Any remaining scar tissue around the fistula was then excised. The first layer of repair was taken about 0.5-1cm from the fistula edge with interrupted stitches, which were placed around the edges of the bladder wall starting from the 3 0'clock position using polyglactin, size 2/0 on an atraumatic needle. The stitches were then tied invaginating the mucosa towards the bladder cavity. A second layer of repair was then performed with interrupted sutures of polyglactin, size 2/0 across the defect in a manner so as to bury the first layer taking care not to allow the sutures breach the bladder mucosa. A third layer of repair was in addition performed in such a way that the adjourning soft tissues were mobilized through a series of figure 8 stitches to support the suture line. The stitches were carefully inserted and left tension-free ensuring that they did not breach the bladder mucosa. The vaginal wall was then closed using interrupted mattress stitches of polyglactin, size 2/0 on an atraumatic needle. Haemostasis was attained. The postoperative management was according to established protocol in the centre, and was the same for all the patents in the study population.

Results

Out of the 140 patients who presented at the study centre with various types and complexities of obstetric fistulas during the two-year period of the study, 58 met the inclusion criteria and were recruited into the study population. The study group comprised patients who had their fistula repaired with a modified technique and the control group who were repaired with the conventional repair technique, each group had 29 patients.

Table 1 shows the socio-demographic parameters of patients in the study population. The mean age of patients in the study group was 23.9±9.6 years and 24.4+2.1 years among patients in the control group. The modal age group in both groups was 26-30 years of age. The vast majority of the patients in the study group and control group were married, 75.9% and 86.2% respectively. In both groups, the majority were secundipara (*i.e.* para 2), 55.2% in the study group and 44.8% in the control group. The majority (41.4% in the study group and

44.8% in the control group) of the patients in both groups had attained primary level of education. A vast majority of the patients in both groups were engaged in the provision of unskilled labour, 65.5% of patients in the study group and 55.2% in the control group.

The duration of the fistula is showed in Table 2. The mean duration of the fistulas among patients in the study population was 1.1±0.3 years with over half (50.0% among patients in the study group and 53.5% of patients in the control group) of the patients had their fistula for less than one year. Only 3.6% of patients had their fistula for over 2 years in both groups. Table 3 and Figure 1 show a comparison of the success rate of obstetric fistula repair in the study group and control group as the postoperative period progressed from the 7th postoperative day to the 21st postoperative day. A highly statistically significant difference (t=5.7735, df= 8, p=0.0004) in success rate between patients in the study group and patients in the control group is shown in the line graph in Figure 1.

Discussion

The discovery of a vesicovaginal fistula repair technique that has a one- chance high cure rate for complex cases of vesicovaginal fistula is desirable, because failed attempts at repair is of prognostic value in the successful repair of complex vesicovaginal fistula. The mean age of patients in the study and control groups were 23.9+9.6 years and 24.4+2.1 years respectively, with a modal age of 26-30 years, comparable to results from a similar study in southern Malawi, where a mean age of 22.8 years and a modal age group of 20-29 years were obtained.[9] Another study in Malawi comprising a larger proportion of VVF patients revealed a modal age group of 20-24 years with the vast majority in the 15-29 years age bracket.[10] These results are indicative of the fact that vesicovaginal fistula is a problem of young women of reproductive age who sustain this devastating maternal injury in their prime. The majority (75.9% and 86.2% respectively) of patients in the study and control groups were married, in agreement with a similar study in Malawi where over half (57.0%) of the women in that series remained married, even though 20.9% of the women in that series were divorced.[9] These findings give credence to the fact that where VVF repair is performed early, the duration of the distressing symptoms is limited and the disruption of the health of affected women is minimal; while such women therefore continue to enjoy spousal and family support.[1,9,11] This is different from the severe disruption of the social wellbeing of affected women, which occurs when VVF becomes protracted or suffers repeated repair failures.[9,11]

The majority of patients in this study population were para 2 with primary level of education, confirming the profile of victims of VVF to be women of low education and parity.[6,9,10] The life of women with VVF is often characterized by the triad of illiteracy, ignorance and poverty, which set the stage for this preventable maternal injury with its debilitating consequences.[11,12] In many of the studies that focus on vesicovaginal fistula- associated factors, affected women are usually primiparous with primary level of education or no formal education.[10,11,12] These findings corroborate the fact that vesicovaginal fistula occurs in unfortunate women living in impoverished societies.[10,12] The mean duration of the fistula in patients in this study was 1.1+0.3 years, probably because of increase public enlightenment and greater awareness in Nigeria that vesicovaginal fistula is amenable to surgical repair. A vast majority

Table 1. Demographic and obstetric parameters of patients in the study.

Parameter	Study group		Control group	
	Number	Percentage (%)	Number	Percentage (%)
Age groups				
<15	1	3.5	0	0.0
15-20	5	17.2	6	20.7
21-25	9	31.0	8	27.6
26-30	13	44.8	13	44.8
>30	1	3.5	2	6.9
Marital status				
Single	7	24.1	4	13.8
Married	22	75.9	25	86.2
Parity				
1	7	24.1	6	20.7
2	16	55.2	13	44.8
3	4	13.8	8	27.6
>4	2	6.9	2	6.9
Educational level				
No formal	9	31.0	8	27.6
Primary	12	41.4	13	44.8
Secondary	5	17.2	6	20.7
Post-secondary	3	10.4	2	6.9
Occupation				
Unemployed	6	20.7	7	24.1
Unskilled	19	65.5	16	55.2
Semiskilled	3	10.3	4	13.8
Skilled/Technical	1	3.5	2	6.9
Total	29	100.0	29	100.0

Table 2. Duration of the fistula among patients in the study.

Duration of fistula	Study group		Control group	
Duration in years	Number	Percentage (%)	Number	Percentage (%)
<1	14	50.0	15	53.5
1-2	13	46.4	12	42.9
> 2	2	3.6	2	3.6
Total	29	100.0	29	100.0

Table 3. Success rate following repair among patients in the study.

Assessment day	Study group		Control group	
Post-op day	No.	Success rate (%)	No.	Success rate (%)
Day 7	22	78.6	17	60.0
Day 10	24	85.7	18	64.3
Day 12	25	89.3	19	67.9
Day 14	26	92.9	20	71.4
Day 21	27	96.4	20	71.4

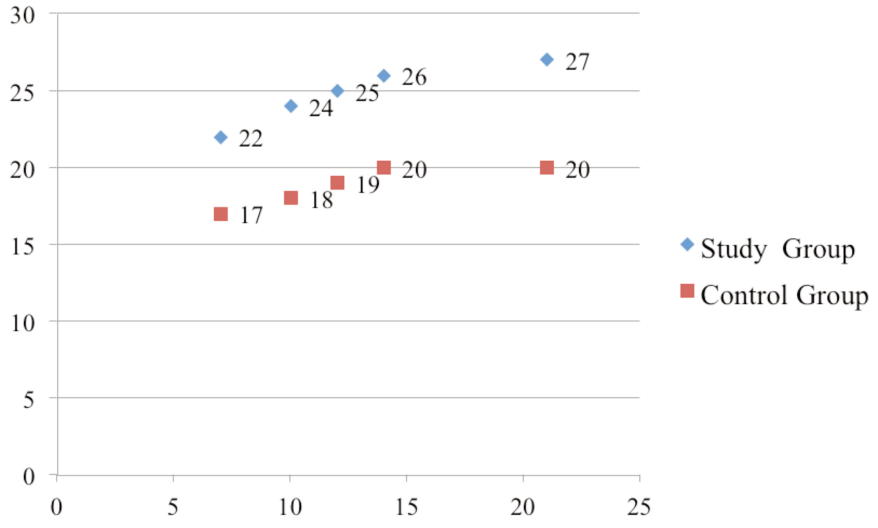

Figure 1. Success rate of VVF repair between the study group (modified) and control group (conventional) techniques as plotted on a line graph.

of Nigerians living in rural communities believe VVF results from some spiritual affliction, and that it has no cure.[13,14] The short duration of the fistula among patients in this study also explains why the rate of divorce and other disruption of the wellbeing of affected women were not prominent among patients in this study.[1,11,14] This study has demonstrated that the use of the described modified surgical repair technique for the closure of selected complex VVF among patients in this study had a significantly higher (p= 0.0004) success rate than the use of the conventional technique of repair. This study was born out of a desire to discover a surgical technique that could give a one-chance opportunity of cure in selected complex cases of vesicovaginal fistula. The described modified repair technique used in this study employs a third layer of repair, which reinforces the suture line and reduces further the risk of failure. Even though, modified methods of VVF repair like plastic surgical techniques and Martius flap procedure have been utilized by different authorities with some successes,[15-17] the reported modified method of VVF repair is innovative, as literature search did not yield any positive finding.

The quest for a method of VVF repair that is highly effective in the repair of complex VVF is justified, considering the fact that in the management of vesicovaginal fistula, the first opportunity presents the best chance of successful repair.[12,18] Conversely, repeated failed attempts at repair aggravates the condition and decreases the chances of successful repair for any given patient.[12,18]

Conclusions

In conclusion, VVF remains a problem of young married illiterate women living in impoverished communities of developing countries. The modified surgical repair technique presented by this study has proved to produce superior results when compared to the conventional repair technique. A recommendation is hereby made to VVF surgeons to embrace the proposed modified repair technique, experiment with it and report on their experiences. The reliability of this proposed technique may pass the test of time and make a difference by mitigating the burden of women living with vesicovaginal fistula in different parts of the world.

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