



The obstetric vesicovaginal fistula: Characteristics of 899 patients from Jos, Nigeria

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KEY WORDS

Vesicovaginal fistula
Rectovaginal fistula
Obstructed labor

Objective: The purpose of this study was to describe the characteristics of women with obstetric vesicovaginal fistulas at a hospital in north central Nigeria.

Study design: A retrospective record review was conducted of all women who were seen with vesicovaginal fistulas at Evangel Hospital in Jos, Plateau State, Nigeria, between January 1992 and June 1999.

Results: A total of 932 fistula cases were identified, of which 899 cases (96.5%) were associated temporally with labor and delivery. The “typical patient” was small and short (44 kg and <150 cm); had been married early (15.5 years) but was now divorced or separated; was uneducated, poor, and from a rural area; had developed her fistula as a primigravida during a labor that lasted at least 2 days and which resulted in a stillborn fetus.

Conclusion: Obstetric vesicovaginal fistula is extremely common in north central Nigeria. A complex interaction that involves multiple biologic and socioeconomic factors appears to predispose young women to this devastating childbirth injury.

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Vesicovaginal fistula is rare in industrialized countries, where it arises mainly as a complication of surgery (usually during hysterectomy) or radiation therapy for cancer.^{1,2} Historically, however, most vesicovaginal fistulas have developed as a consequence of prolonged ob-

structed labor.³ Although fistulas from this cause are now virtually unknown in the Western world, this is not the case in the non-industrialized developing countries of Africa and south Asia, where maternal mortality rates remain nearly 100 times higher than the rates found in the affluent West and where women's health is impaired frequently by catastrophic, but non-fatal, obstetric injury.^{4,5} These problems are particularly acute in Nigeria, the most populous country in sub-Saharan Africa, where at least 1% of all pregnant women will die of obstetric complications⁴ and where obstructed labor is a leading cause of maternal death. Women who survive obstructed labor often develop a vesicovaginal fistula.⁶

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In an attempt to meet the clinical needs of the large numbers of women with childbirth-related injuries, a program of care for women with vesicovaginal fistulas was begun at Evangel Hospital in Jos, Nigeria, in late 1990.⁷ Jos, the capital of Plateau State, is located near the northern border of that state in a “spike” of land that juts northward towards Kano State, splitting the neighboring states of Kaduna to the west and Bauchi to the east (Figure 1). Health care resources are inadequate to meet the needs of the childbearing population throughout Nigeria as a whole, but these problems are even more acute in the northern regions of the country.⁸ We reviewed the hospital charts of all women who were admitted to Evangel Hospital with a vesicovaginal fistula to ascertain the population characteristics of these patients and to assess the magnitude of the fistula problem in our area. This report represents one of the largest and most detailed analyses of patients in Africa with vesicovaginal fistula that has been undertaken to date.

Material and methods

Institutional approval was obtained from the medical staff committee, and hospital records were reviewed subsequently on 932 women who came to Evangel Hospital with a fistula between January 1992 and June 1999. A detailed history for each patient had been obtained at the time of admission with the use of a standardized database. Data included patient age, height, weight, age at menarche, age at marriage, obstetric history, history of contraceptive use, occupation, education level, and marital status. Clinical data for the index pregnancy (the pregnancy in which the obstetric fistula occurred) included the duration of labor, the place of delivery, the type of delivery, the birth attendant, the reason for delay in seeking care once labor had become obstructed, the pregnancy outcome, and the duration of the fistula before the patient sought care.

Results

A total of 932 patients with a fistula were seen over this time period. The overwhelming majority of these injuries were associated temporally with labor and delivery (899 cases; 96.5%). The remaining 33 fistulas were due to other causes, which included a form of traditional Hausa surgery called *gishiri-cutting*, in which a traditional practitioner (such as a barber or midwife) makes a series of random cuts inside the vagina with a sharp instrument (such as a razor blade) in an attempt to enlarge the birth passage (21 cases); trauma (4 cases), or malignancy (8 cases). Of the obstetric cases, 764 cases (85%) were vesicovaginal fistulas alone; 99 cases (11%) were combined vesicovaginal and rectovaginal fistulas, and 36 cases (4%) were isolated rectovaginal fistulas. The 899 cases of obstetric fistula form the basis of this report.

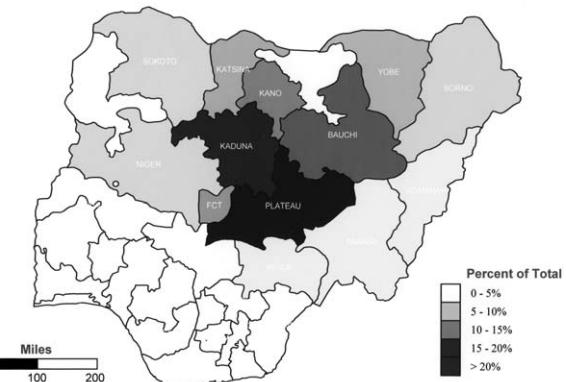


Figure 1 Distribution of patients with obstetric fistula at Evangel Hospital by state (Nigeria).

Women with a fistula had been married young and tended to be short and thin. According to the data that were collected, the median age of the patients with a fistula was 27 years (range, 13-70 years); 19 patients (2.1%) were unable to state their ages. Biologic markers (such as the age of menarche) may be a more reliable indicator of relevant age in relation to obstetric problems (such as fistula formation). The mean age at menarche was 14.5 years, and the mean age at marriage was 15.5 years; but 352 women (39.1%) had not yet menstruated at the time of marriage, and 302 women (33.6%) had been married by the age of 14 years. The mean weight of these patients was 43.6 kg (range, 31-84 kg); 55% of patients weighed <50 kg. These women were also short, with 79.4% being <150 cm tall (range, 121-180 cm). Patients with fistula tended to be poorly educated, from impoverished rural backgrounds, and have low contraceptive prevalence. Most of these women were illiterate: 700 patients (77.9%) had no formal education, and only 126 patients (14%) had any primary school education. Thirteen women (1.4%) had some secondary school education. None of the patients had any education beyond secondary school. An additional 60 women (6.7%) reported having had some traditional Muslim religious education, which consists mainly of rote memorization of scriptural passages from the Koran.

The occupational status of the patients, their husbands, and the patients' fathers are given in Table I. The data show that the overwhelming majority of these women were from poor rural backgrounds. In this, as in most other African societies, large families are the desired social norm. Although 538 women (59.8%) admitted having some knowledge of contraceptive techniques, only 40 patients (4.5%) admitted to having used any form of contraception in the past. As expected, most of these patients came from Plateau State itself or from the bordering states of Kaduna and Bauchi (Figure 1); however, a few patients came from as far away as the Niger Republic.

Table I Occupation of patients, their husbands, and the patients' fathers

Occupation	Patient (n)	Patient's husband (n)	Patients' father (n)
Agriculture	394	431	646
Housewife	259	—	—
Menial labor	127	88	51
Petty trading	109	121	63
White collar job*	10	43	25

* Refers to a variety of low-level office, administrative, or "salaried" positions rather than manual labor or market commerce.

Fistulas developed most commonly in a woman's first pregnancy, with 45.8% of fistulas (412) occurring in primigravidae; however, 20% of fistulas occurred in women of high parity (≥ 4 pregnancies; 183 patients). For the index pregnancies in which the fistula occurred, there was a stillbirth rate of 91.7% (824 deaths). Of the 75 live births, 14 neonates died within the first 4 weeks of life, usually within 7 days of delivery. Overall perinatal survival was therefore only 7%. Most neonates were male (70.6%; 635 cases); 23.4% of the neonates were female (210 babies), and 54 fetuses were of unknown sex (6%). The overall reproductive outcome for these women was dismal. These 899 women had given birth to a total of 2729 babies in the course of their reproductive lives, of whom only 819 children (30.0%) were still alive. Data on the use of obstetric services showed that 647 of these women (72%) did not have any antenatal care. Nevertheless, only 211 women (23.5%) gave birth at home. The rest of the women (688 patients, 76.5%) were delivered at some type of health facility. Deliveries were attended by untrained traditional birth attendants in 211 cases (23.5%), by attendants with some level of formal health care training in 239 cases (26.6%), and by "doctors" (with highly variable levels of obstetric experience) in 449 cases (49.9%). Spontaneous vaginal delivery (which usually occurred after fetal death and subsequent maceration of the fetal body) took place in 447 cases (49.7%), but more than one half of these women (452 cases; 50.2%) ultimately underwent some form of operative delivery: 363 women (40.3%) had cesarean delivery; 82 women (9.1%) underwent a forceps delivery, and the rest of the women were delivered with the use of a vacuum extractor (7 cases; 0.7%).

Delay in seeking care once labor had become obstructed was very common. Only 190 patients who had an obstetric fistula (21.1%) sought help when they had been in labor for ≤ 1 day. Most patients with a fistula labored much longer: 272 women (30.2%) had been in labor for 2 days; 244 women (27.1%) had been in labor for 3 days, and 193 women (21.4%) reported having been in labor for ≥ 4 days at the time of delivery. The reported causes for the delay in seeking care are given in Table II. Delay in seeking care once a fistula had de-

Table II Causes of delay in seeking care in obstructed labor

Cause of delay	Patients (n)
No permission from family to seek emergency obstetric care	258 (28.7%)
Lack of accessible transportation	225 (25.0%)
Wanted to try traditional remedies first	67 (7.4%)
Unaware of the availability of hospital obstetric care	58 (6.5%)
No health care facility nearby	50 (5.6%)
Unknown, not recorded, or no reason given	241 (26.8%)

veloped was also common. Only 39 women (4.3%) sought help for a fistula of <3 months' duration, and most women had suffered for prolonged periods of time before they sought relief at Evangel Hospital (Figure 2).

The social consequences of the fistula for the afflicted woman were severe. Only 238 patients (26.4%) were still married at the time of admission; 440 women (48.9%) had been divorced by their husbands; 199 women (22.1%) were separated from their husbands, and 22 women (2.4%) were widows. General information was sought from these women on coital activity since sustaining their fistulas. Only 238 women (26.4%) were engaging in regular intercourse; these were the women who were still married. Nearly 60% of the patients (527 women) with a fistula were not active sexually; 60 women had "infrequent" sex (6.7%), and 76 women (8.5%) did not respond or declined to answer this question.

The surgical techniques that were used in repairing the fistulas in this series have been described in detail elsewhere.^{7,9} Among surgeons who work with patients with obstetric fistula in Nigeria and other Third World settings, there is broad consensus favoring a simple, low-technology, transvaginal approach to fistula repair under spinal anesthesia.¹⁰⁻¹² Transabdominal operations, which require the use of more advanced anesthetic capabilities and carry much higher morbidity in this setting, are reserved for rare or exceptional cases.⁷ The operative techniques used in this series have followed generally accepted principles of fistula surgery: wide mobilization of the fistula so that it can be closed without tension on the suture line, closure of the defect in multiple layers whenever possible, prolonged postoperative bladder drainage to prevent bladder overdistension and rupture of the site of closure, and liberal use of pedicled flaps to bring in a new blood supply to the injured tissues surrounding the fistula to improve wound healing.^{7,9,11,12} The fistulas reported here ranged in size from pinpoint (<2 mm) to >8 cm. The average fistula was approximately 3.5 cm in diameter. "Successful closure,"

as defined by most fistula surgeons, means that the fistulous opening itself has been completely closed and that there is no leakage of urine through the site of the repair. Long-term postoperative follow-up of patients with a fistula who have undergone surgical repair has proved to be impossible, because these women typically travel long distances from remote rural areas and do not have access either to postal services or to telephones, and they usually return to these areas after surgery. Many patients are never seen again after they leave the hospital, because the cost of return transportation is prohibitive given their life circumstances. As a result, successful closure of a fistula generally means "successful closure at the time of hospital discharge." Failed repairs are obvious as soon as the patient's urinary catheter is removed 14 days after surgery, and there is no evidence that spontaneous breakdown of successfully repaired fistulas occurs at a later date, unless some other cause intervenes (such as a subsequent pregnancy that is again complicated by obstructed labor). Of the 899 obstetric fistulas in this series, 827 fistulas (92%) were repaired successfully, which required an average of 1.2 operations per patient to achieve successful closure, an experience that coincides with that reported by other authors.¹² The most important predictor of failed surgical closure appears to be the amount of vaginal scarring that has developed as a result of the pressure necrosis that was induced by obstructed labor. In practical terms, however, "success" for the patient with a fistula means not only complete closure of the fistula but also a bladder that functions normally after surgery. Success in these terms is more difficult to achieve: 135 of the women (16.3%) who underwent successful fistula closure remained incontinent postoperatively because they had sustained marked urethral sphincter injury during labor. Urethral damage is often coupled with a marked decrease in bladder capacity in these women. The combination of extensive pressure necrosis of the bladder and vagina, subsequent scarring, and the wide mobilization of tissues that are required for successful fistula closure leaves some of these women with bladder capacities of <100 mL.

Comment

Maternal mortality in northern Nigeria is exceptionally high, approximately 1050 maternal deaths per 100,000 births^{4,6}; some authors have suggested that Nigeria alone accounts for up to 10% of the world's total maternal deaths.¹³ Studies in several developing countries have shown that non-fatal maternal morbidity is 24 to 114 times more common than maternal death.⁵ As would be expected, there appears to be a correlation between the exceptionally high maternal mortality ratio that is seen in Nigeria and large numbers of women

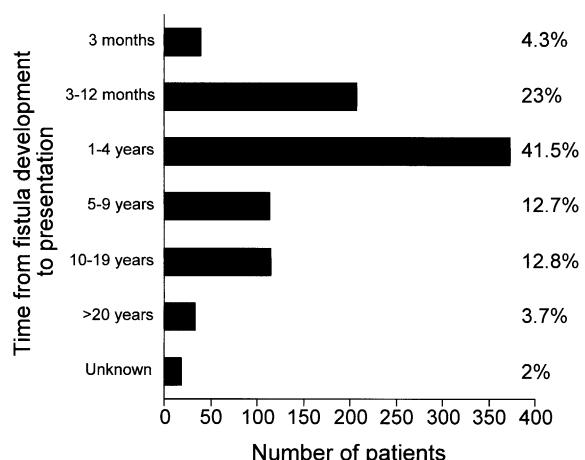


Figure 2 Delay in seeking care after the development of a fistula.

who have sustained serious birth injury. The large number of obstetric vesicovaginal fistulas that are reported in this and other papers confirms this relationship.¹⁴ Numerous biologic and social factors interact to produce this situation.

Unlike the fistulas that are seen after hysterectomy, which are the result of isolated trauma to otherwise healthy parts of the vesicovaginal septum, the fistula that develops from obstructed labor is believed to be the result of a broad field injury that is caused by the compression of maternal soft tissues between the fetal head and the mother's pelvic bones.⁴ Prolonged compression of these tissues leads to widespread ischemic injury of the maternal pelvis, with resulting tissue necrosis and fistula formation. Often the afflicted woman is left with one or more additional injuries that together comprise the obstructed labor injury complex.¹⁵

The biologic nature of human reproduction in northern Nigeria is such that cephalopelvic disproportion is common. In this part of Africa, marriage traditionally takes place at an early age. Because growth in height typically stops at menarche, while growth in pelvic capacity continues,¹⁶ women who are married this early are exposed to the risk of pregnancy before they have reached their full adult pelvic capacity. The women in this series also tended to be thin and short, both independent risk factors for obstructed labor.¹⁷ Comparative pelvimetric studies have suggested that the pelvis of African women are narrower than those of their European counterparts.¹⁸ The combination of early marriage, small size, short stature, incomplete pelvic growth, and a generally narrow pelvis predispose this population of women to cephalopelvic disproportion during labor.

Diverse fetal factors also increase the prevalence of obstructed labor in this group of women. Of note is the fact that nearly 71% of the fetuses who are born to the women who had an obstetric fistula were male.

Northern Nigeria has one of the highest reported male: female birth ratios in the world, with 107 male infants born for every 100 female infants.¹⁹ This preponderance of male births, combined with the fact that the average male birth weight is substantially greater than the average female birth weight in northern Nigeria²⁰ and the fact that macrosomic babies in West Africa are overwhelmingly male²¹ makes it even more likely that a northern Nigerian woman may experience obstructed labor, especially if she is carrying a male fetus.

The mere presence of obstructed labor, by itself, is not sufficient to create a vesicovaginal fistula. The major risk factor appears to be prolonged obstruction that produces an extended period of ischemia of the vesicovaginal septum that, in turn, leads to tissue necrosis and the subsequent development of a vesicovaginal fistula.³ In their analysis of factors that contribute to maternal mortality in developing countries, Thaddeus and Maine²² suggested that delay in obtaining adequate emergency obstetric care was the result of a cascade of 3 contributing factors: (1) a delay in deciding to seek care, (2) a delay in arriving at a suitable health care facility, and 3) a delay in receiving appropriate care once the patient arrives at that facility. These 3 factors also appear to influence the formation of vesicovaginal fistulas by prolonging the time that a woman remains in obstructed labor. Nearly 80% of the patients with fistula in this series had been in labor for ≥ 2 days before they were delivered, and a similar proportion had received no antenatal care. In this part of Africa, there is a strong belief that women's movements must be under strict male control, usually by her husband. Permission from the husband or a suitable male surrogate must be obtained before money can be spent on health care or before a woman can leave home to seek hospital treatment, even in emergency situations. In Nigeria, as in other African countries, the use of health care services declines exponentially as the distance which one must travel to reach the facility increases.²³ Table II shows the causes of delay in seeking care during labor reported by these women.

Two additional important points should be made in this regard. First, in this part of the world much suffering is thought to represent the inevitable "Will of God." This viewpoint often breeds an inertia that is difficult to overcome, particularly if the problem involves women's health. Because a high level of maternal mortality already exists, the fact that women die in childbirth is seen by many as part of the "normal" state of affairs, and a high level of maternal birth injury tends to be accepted as inevitable, when in fact timely intervention could prevent its occurrence. Second, the unfortunate fact is that, as the Nigerian economy has deteriorated, health care facilities have also become impoverished. User fees have been instituted widely, not just in Nigeria but also in most other African countries in an attempt to

help pay for health care services. In virtually all cases, this has driven away needy patients and has delayed access to emergency obstetric care until the situation becomes desperate.^{13,24} For example, in Sokoto in northwestern Nigeria, 1 in 72 labors is complicated by the presence of a spontaneous uterine rupture in an otherwise unscarred uterus because of the high prevalence of obstructed labor and a delay in seeking care.²⁵ These problems are amplified by the poor general state of health care facilities, a lack of adequate material resources, and a lack of physicians with adequate training to deal with complex operative obstetric emergencies.^{18,26} When operative obstetric procedures are attempted by untrained and unskilled practitioners, the possibility of making matters worse is always present. In traditional Hausa medicine, a barber or a midwife frequently will insert a sharp object (such as a knife or razor blade) into the patient's vagina and make random cuts (*gishiri-cutting*) in an attempt to enlarge the birth canal and relieve the obstruction. Often this practice itself results in the creation of a fistula.⁸

For the woman who has a fistula, the social consequences are devastating. These injuries do not heal without surgical intervention, and the general absence of suitable facilities and adequately trained surgeons means that effective care is usually unavailable. Many patients suffer for years with a condition that could easily be cured by low-technology surgical operations. When it becomes obvious that the fistula will not heal spontaneously and that the condition is chronic, these women gradually become outcasts: 74% of these women were divorced or separated from their husbands, which is a devastating loss of social support in an African context that has been documented by other researchers.^{27,28}

There are a number of limitations to this study. Fistulas appear to be most common in the poorest parts of the world where access to emergency obstetric services is minimal, where parity is high, where transportation is poor, and where the status of women is low. These conditions are almost always correlated with poor vital statistics record-keeping and a general lack of demographic data that could be used to calculate the true incidence and prevalence of obstructed labor and subsequent fistula formation. Because of their continuous urinary incontinence and the associated stigma, victims of fistula are largely a hidden population that is obscured from general public view. It is only after programs for surgical repair and rehabilitation become available that these women again become visible, often traveling long distances to seek relief. Virtually all research on obstetric fistula patients therefore has been carried out in hospital settings, which may not reflect the true situation of community-dwelling women with this condition. These same life circumstances have also made it extremely difficult to obtain accurate follow-up information about the long-term success of fistula surgery and the future

life prospects of women who have been injured in this fashion.

Physically unclean from the constant loss of urine and stool, uneducated, poor, unable to fulfill their socially mandated roles as wives and mothers, often unjustly stigmatized as being somehow personally responsible for their condition because of an unacknowledged "sin," these women represent a neglected and increasing social problem in developing countries. The long-term solution to this problem lies in the elimination of the occurrence of prolonged obstructed labor by the development of a comprehensive system of emergency obstetric care to which all pregnant women have prompt access. The alleviation of the suffering of the hundreds of thousands of women who are afflicted currently with a fistula requires the development of specialized centers that are dedicated to providing efficient, low-technology surgical repair of these injuries. Unfortunately, as Weil and Fernandez²⁹ have commented, "safe motherhood" programs in developing countries have become orphan initiatives, which lack the support of domestic politicians in those nations where the problems are most acute and within the international community abroad. Studies such as this one may help raise the level of international awareness of this tragic situation. There is an urgent need for new initiatives in these countries to develop health care infrastructures than can both prevent the development of new fistulas and provide adequate timely access to reconstructive surgery for those women who are afflicted currently with this devastating malady.

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Discussion

Dr Mary Lake Polan. The earliest references to obstetric fistula come from Egypt in 1550 BC. Subsequently Avicenna, the renowned Arab-Persian physician, first described the relationship between fistula development and obstructed labor in 1037 AD.¹ Until the 20th century, such vesicovaginal fistulas were a common aftermath of delivery among US women, which led J. Marion Sims to develop surgical techniques to repair