

Original Article

Epidemiological and Surgical Aspects of Urogenital Fistulae: A Review of 25 Years' Experience in Southeast Nigeria

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Abstract: The aim of the study was to determine the epidemiological background, clinical details and surgical outcome of patients presenting with urogenital fistulae to St Luke's Hospital, Uyo, and the associated VVF Unit at Mbribit Itam, Akwa Ibom State, Nigeria, between January 1970 and December 1994. A retrospective review of hospital operating theater records and case notes was carried out. Clinical details and outcome were assessed for the total cohort of 2484 patients. Epidemiological data were extracted from the case notes of 715 patients presenting between January 1990 and December 1994. Of these 92.2% were of obstetric etiology, 80.3% following neglected obstructed labor, 6.9% following cesarean section, and 5.0% followed ruptured uterus; 4.4% followed pelvic surgery and the remaining 3.4% of miscellaneous causes included malignancy, coital injury, infection and trauma; 8% had a coexisting rectovaginal fistula or third-degree perineal tear. Only 37.3% of patients were aware of their age; the median age of this group was 28 years. Literacy was difficult to judge reliably, although 29% were able to sign their name. Parity ranged from 0 to 17, and only 31.4% of fistulae related to first pregnancies. Although 73.1% were delivered in hospital, in 97.1% labor was initially managed at home, with a traditional birth attendant, in a maternity home, or in church; 34.1% were delivered by cesarean section, although the live-birth rate was only 10.3% in the causative pregnancy. For a variety of reasons 124 women were not operated upon: 1954 underwent only one operation, giving a presumptive cure rate at first operation of 81.2%; 247 underwent two, 116 three, 32 four, and 11 five operations during the

study period. The ultimate closure rate was 97.7%, with only 0.6% undergoing urinary diversion. The type and distribution of fistulae recorded in this series is consistent with previous series of largely obstetric fistulae from the developing world. Surgical cure rates are also comparable. The epidemiological background is at variance with previous reports in several respects; this may reflect biosocial differences in the population studied.

Keywords: Epidemiology; Obstetric trauma; Surgery; Urogenital fistula

Introduction

The prevalence of urogenital fistula is largely unknown, although high levels have been reported especially in areas of sub-Saharan Africa, particularly in Sudan [1], Chad [2], Nigeria [3], Ethiopia [4] and Ghana [5]. An incidence of 1–2 per 1000 deliveries has been estimated, with a worldwide annual incidence of 50 000–100 000 [6] and a prevalence of untreated fistulae of 500 000–2 000 000 [6]. The incidence clearly relates to the level of maternity care provision, those areas with high maternal mortality tending also to have high fistula rates. Danso and colleagues [5] have suggested that a more realistic estimate of the incidence of fistula in any community might be that it approaches the maternal mortality rate. This might indicate an annual incidence worldwide of up to 500 000. Harrison [7,8] reported an overall maternal and perinatal mortality rate of 10 and 90 per 1000, respectively, and 34 and 125 per 1000 in primipara under 16 years of age in northern Nigeria. The majority of fistula patients in developing countries have

been said to be teenage primigravidae [3,6,9–11]. Although obstructed labor is undoubtedly the most significant single etiologic factor, the problems are compounded by many social and cultural factors which may delay referral to specialist care once arrest of labor occurs [12–14]. This study was undertaken to compare the influence of these and other etiologic and epidemiologic factors with earlier reports, and to determine the fistula types and surgical success within the unit.

Patients and Methods

The study was undertaken during the course of two visits made by the first author to St Luke's Hospital, Uyo, and the associated VVF Unit at Mbribit Itam, Akwa Ibom State, Nigeria, in 1989 and 1995. Cases were identified from operating theater record books, and notes were subsequently retrieved from the hospital records department; 2979 operative procedures were initially identified undertaken in 2484 patients between January 1970 and December 1994; 2389 case notes were subsequently retrieved (96%). Details of the causative processes, fistula site and surgical procedure(s) undertaken were well recorded in notes throughout the study period. Epidemiological data were less well recorded in the early part of the study, and it was decided to limit analysis of these aspects to the period between the two visits, i.e. between January 1990 and December 1994: 715 patients were identified during this period, from whom 656 case records (92%) were available for review.

Results

Etiology

The etiologic factors, as far as could be established from case notes, are shown in Table 1: 92.2% of cases were of obstetric etiology. The majority of these (80.3% of the

total) resulted from neglected obstructed labor and the remainder from cesarean section or ruptured uterus; assisted vaginal delivery did not seem to be a significant etiologic factor. Previous gynecologic surgery was a factor in 4.4% of cases, and 3.4% arose from miscellaneous causes, including malignancy (1.7%), coital injury (0.9%), other trauma (0.5%), and infection (0.3%); the latter cases related to lymphogranuloma.

Patient Source

Fifty percent of patients lived in the local state (Akwa Ibom); the remaining 50% were largely from neighboring states, although a proportion travelled distances up to 1000 miles for treatment.

Age, Educational and Marital Status

Only 245 of the 656 patients for whom notes were retrieved in the epidemiologic part of the study (37.3%) were aware of their age at the time of presentation. This reflects their literacy, the relative under emphasis on age and birth date in this society, and also the impact of the civil war of 1967–1970, those unaware of their age stating simply that they were born before the war. Those who were aware of their age ranged between 7 and 68 years, with a median of 28 years.

The many languages used among the patient group made literacy difficult to judge, and it was rarely specifically recorded in notes; 29.0% were able to sign their name on the operation consent forms, suggesting that they had received at least a rudimentary education; the remainder indicated consent to surgery by their right thumbprint.

At the time of presentation 410 patients (62.5%) were married, 72 (11.0%) were single and 106 (16.2%) widowed; only 68 (10.4%) had been deserted by their husbands since the development of their fistula, 2.9% being separated and 7.5% divorced.

Table 1. Etiology in the 2389 cases out of 2484 identified, for whom notes could be retrieved from the hospital records department

Major aetiology Sub-group	No.	Percentage	No.	Percentage
Obstetric	2202	92.2		
Obstructed labour			1918	80.3
Cesarean section			165	6.9
Ruptured uterus			119	5.0
Surgery	105	4.4	105	4.4
Miscellaneous	82	3.4		
Malignancy			42	1.7
Coital injury			22	0.9
Trauma			11	0.5
Infection			7	0.3
Radiotherapy	0	0.0	0	0.0
Total	2389	100.0	2389	100.0

Past Obstetric History

Of the obstetric fistulae 31.4% followed first pregnancies (Fig. 1); parity ranged from 0 to 17, with a median of three pregnancies; 7.6% of the patients' previous pregnancies had ended in spontaneous miscarriage, individual patients reporting 0–6 miscarriages, with a median of 0, and mean of 0.27 miscarriages; 44.4% of previous pregnancies had ended in stillbirth, individual patients reporting 0–8 (median 0, mean 1.0) stillbirths. Although 48.1% of the previous pregnancies had resulted in a live birth, only 27.5% of patients had had one or more previous live births (range 0–10, median 1, mean 1.7).

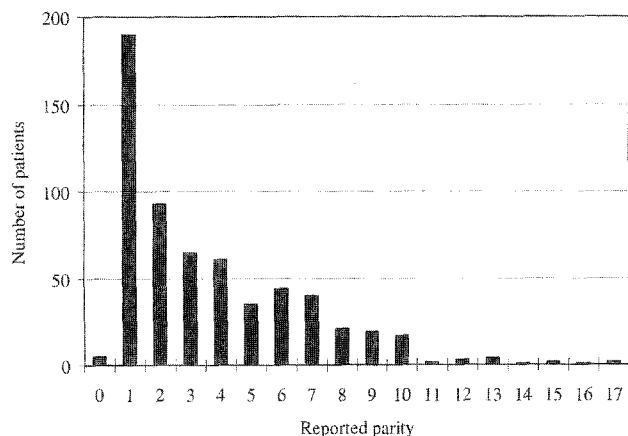


Fig. 1. Parity distribution of the 605 obstetric cases, out of 715 managed between January 1990 and December 1994, for whom notes could be retrieved.

Antecedent Labor and Delivery

The site in which the patients spent the majority of their labor and the place of delivery are shown in Table 2. Only 2.9% of women had spent the majority of their labor in hospital: most had labored at home, with a traditional birth attendant, in a peripheral maternity home or health center, or in church. By the time of

Table 2. Place of labor and delivery in the 605 obstetric cases out of the 656 managed between January 1990 and December 1994, for whom notes could be retrieved

	Labor		Delivery	
	No.	Percentage	No.	Percentage
Home	330	54.6	90	14.9
Traditional birth attendant	167	27.7	57	9.5
Health center	35	5.8	5	0.8
Maternity home	30	5.0	5	0.8
Church	25	4.0	6	0.9
Hospital	18	2.9	442	73.1
Total	605	100.0	605	100.0

Table 3. Mode of delivery and live-birth rate for the 605 obstetric cases out of the 656 managed between January 1990 and December 1994, for whom notes could be retrieved

Mode of delivery	No.	Percentage	Live births	Live birth rate (%)
Spontaneous	320	52.9	11	3.4
Cesarean section	206	34.0	47	22.8
Ventouse	24	4.0	3	12.5
Forceps	12	2.0	1	8.3
Symphysiotomy or craniotomy	18	3.0	0	0
Laparotomy	18	3.0	0	0
Vaginal breech	7	1.2	0	0
Total	605	100.0	62	10.3

delivery 73.1% had been transferred to hospital, the duration of labor prior to transfer averaging 2.5 days.

The mode of delivery in the associated pregnancies is shown in Table 3. The neonatal outcome appeared to relate to mode of delivery. The live-birth rate was only 3.4% following spontaneous vaginal deliveries, 11.1% following assisted vaginal deliveries, and 22.8% following cesarean section. The overall live-birth rate from antecedent pregnancies was only 10.3%.

Duration of History

The length of history at presentation was extremely variable, ranging from a few days to 38 years; the average delay was 61.5 months.

Menstrual Status

The menstrual status of patients at the time of presentation showed an interesting pattern: 44% of patients were amenorrheic at the time of referral, and the average delay between the associated pregnancy and presentation was 23.4 months; 39% had resumed menstruation and their average delay to presentation was 51.0 months. The remaining 17% of patients were presumed postmenopausal, and had a mean delay to presentation of 183.4 months.

Fistula Types

Fistulae may be classified on the basis of site or complexity, complex cases being those with poor access for repair, significant tissue loss, ureteric involvement, or where there is a coexistent rectovaginal fistula. In this series 4.5% had ureteric involvement and 8.0% were associated with coexistent rectovaginal fistula. The site of fistulae is shown in Table 4. Over 70% were mid-vaginal, juxtacervical or large (i.e. involving the whole of the bladder base between mid-vaginal and cervical levels).

Table 4. Site of the initial fistula in the total group of 2484 patients for whom an operative record was identified

Fistula site	No.	Percentage
Urethral	70	2.8
Subsymphyseal	75	3.0
Bladder neck	132	5.3
Mid-vaginal	579	23.3
Large	432	17.4
Juxtacervical	773	31.1
Vault	5	0.2
Uterus or cervix	77	3.1
Multiple	89	3.6
Unspecified	252	10.2
Total	2484	100.0

Primary Surgical Procedures

Of primary operations 83% were carried out vaginally and 17% abdominally. Of the vaginal procedures 3% were repaired in a 'reverse lithotomy' position, with the patient prone on the operating table; these were largely bladder-neck or subsymphyseal fistulae; 4% of procedures were combined with a rectovaginal fistula repair; 0.6% of patients underwent urinary diversion.

Surgical Outcome

The assessment of surgical cure in this environment is difficult, as patients, especially those traveling long distances, rarely return for follow-up. Equally, however, they are rarely happy to leave the unit until they are dry. For the purposes of this retrospective study, therefore, cure has been defined as the point at which patients were subjectively dry at their last assessment, and subsequently underwent no further surgery within the study period.

During the study period 124 patients were not operated upon; 1954 underwent a single operation and, as far as could be established from the notes, were cured at this first operation (82.8%); 247 patients underwent a second operation, 116 a third, 32 a fourth and 11 a fifth operation during the study. In total, therefore, 2979 urogenital fistula procedures were carried out in the 2484 patients. There were in addition 32 patients who were known still to be wet after a first operation, yet underwent no further surgery; 10 still wet after a second operation, 1 after a fourth operation, and 2 after a fifth operation. These were therefore added to calculate 'corrected' cure rates (Fig. 2). Although the cumulative corrected cure rate rises progressively with succeeding operations, the cure rate by operation falls from 81.2% for first procedures to 65.0% for those requiring two or more procedures.

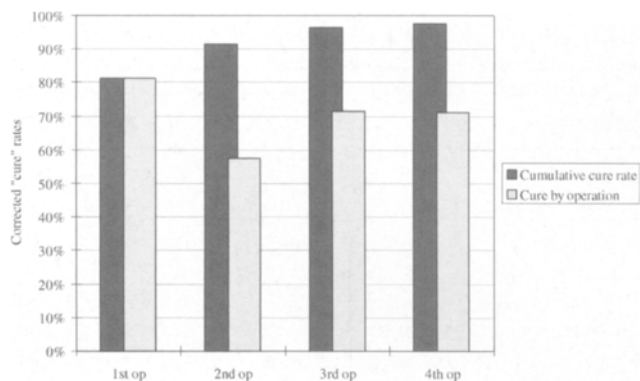


Fig. 2. Corrected cumulative cure rate and cure rate by operation number.

Discussion

The majority of patients in the study area are delivered at home, and in the absence of any effective process for the registration of births it is impossible to estimate the incidence of urogenital fistula with respect to delivery rate. Of those women attending hospital for delivery, however, the rate equates to 1.69 fistulae per 100 deliveries (based on 50% of the cases being from the local state area). The maternal mortality rate in the hospital within the period of the study varied between 0.6% and 1.6% (Itina S, personal communication). The overall fistula prevalence would therefore seem to be in keeping with previous reports [5,6,10], and in particular with the suggestion of Danso and colleagues, that the incidence of fistulae in any community might approach the maternal mortality rate [5]. It is, however, important to realize that whereas all maternal deaths, and probably most fistulae, eventually find their way to hospital, the majority of deliveries take place in the community. Although the incidence of fistulae and of maternal deaths may be related, neither figure should be taken to represent the overall incidence of the conditions in the population served.

The etiology of these cases, with 92.2% of obstetric etiology and 80.3% apparently related to neglected obstructed labor, is also very much in keeping with those of other series. The distribution of fistula types is also compatible with their largely obstetric etiology. Over 70% were mid-vaginal, juxtacervical or large in type. This distribution indicates the area of the vagina at greatest risk during obstructed labor, and therefore reflects the predominance of this factor in etiologic terms.

The association between obstetric fistulae and traditional surgical practices, e.g. circumcision and gishiri, has previously been emphasized [3,14] as an important etiologic factor in fistula, especially when they occur in relation to a first pregnancy. Such practices were not commonly recorded in the notes of patients in this series, and although probably not consistently specifically asked about, are not thought to be a significant factor in the etiology of fistulae in this population.

The importance of early marriage and childbearing in the development of obstetric fistulae has also to be emphasized (Table 5). Tahzib [3], from northern Nigeria, found 32.9% of patients to be under 16 years of age and 54.8% under 20 at the time of the development of their fistula. In the series reported from Ethiopia by Kelly and Kwast [15], 7% were under 16 and 42% under 20 at presentation. Murphy, also from northern Nigeria, reported that 88% of new referrals were under 16 at the time of their marriage, and 64% were under 18 at the time of their first pregnancy [14]. They also demonstrated, however, that the age distribution at marriage and first childbirth was not, in fact different from that of a control population of patients (with postpartum cardiac failure), early marriage and early childbearing being the norm, particularly in the Muslim culture of Hausaland. Within our present series

Table 5. Epidemiologic details from several series of fistula patients from different cultures within sub-Saharan Africa

	Northern Nigeria [14]	Northern Nigeria [3]	Ethiopia [15]	Ghana [5]	Southeast Nigeria – present study
Mean age (yrs)	20	21	22	26.6	28
% <16	45	33	7	4	13
% <20	69	55	42	21	32
Mean parity	?	1.6	2.1	2.6	3.5
% in first pregnancy	65	52	63	42.7	31
% divorced/deserted	54	?	52	?	10
% literacy	8	0.2	?	?	29
% home delivery	?	64	58	?	27

many patients were unaware of their age, although the mean age of those who did know was 28 years, and only 13.1% were under 16 years of presentation. It is likely that most of those who were unaware of their age were born prior to the civil war in Nigeria.

Murphy also found that 65% of new fistula patients had developed their fistula in relation to a first pregnancy, and 90% of their long-term patients had no living children [14]. In the current series only 31.4% arose in relation to first pregnancies; 48% of previous pregnancies to fistula patients had resulted in live births, and 27.5% of the patients had one or more living children. In respect of their previous obstetric experience our population seems more closely related to that reported from Ghana by Danso and colleagues, where the mean age of patients was 26.6, with only 21.3% being under 20 years, and the mean parity was 2.6 [5].

Others have also drawn attention to the educational background of fistula patients and their families. Murphy [14] found that the husbands of only 15% of their new patients and 8% of their long-term patients had received any form of modern education, compared to 31% of their control population [14]. Tahzib [3] found that only 0.2% of patients themselves had even the most rudimentary education, compared to 7% of all women delivering in that population [8]. Although the educational status of our patients was difficult to establish, 29% were literate to the extent of being able to sign their name at least, indicating that they had probably completed primary education.

Most previous reports have emphasized the importance of home delivery to the etiology of fistulae. Tahzib found that only 6.4% of their patients had delivered in hospital, and 64.4% at home [3]. Kelly and Kwast reported that 59.4% of women were either unattended, or attended only by family members or unqualified practitioners in labor [15]. In the present series 73% delivered in hospital, although 97% had spent the greater part of their labor away from hospital, with a substantial delay – averaging 2.5 days – before transferring to hospital. In some parts of the world this delay reflects geographic factors and problems of access. In Ethiopia Kelly and Kwast reported that 75% of the population live 2.5 days' walk from the nearest all-weather road [15]. In the present series 50% were from the local state area, and although the riverine nature of the Niger delta

and Cross River area makes transportation difficult for some, for the majority this would not be the case. Of greater significance in determining delay in transfer to hospital is the local culture of mistrust or fear of hospital practices, the sense of failure in not achieving normal delivery, and the need to obtain consent from husband or elders for hospital attendance. The development of many independent neo-Christian churches in the area also appears to be of some significance in contributing to delay in some cases a number of women laboring in church for several days before ultimate transfer to hospital in extremis.

The high incidence of operative delivery is also in contrast to previous series: 34% were delivered by cesarean section, compared to 7.3% reported by Kelly and Kwast [15] and 6.7% reported by Tahzib [3]. Despite this, the perinatal outcome was not greatly improved: although those delivered by cesarean section had a live-birth rate of 22.8%, the overall live-birth rate was only 10.3% (compared to 7.3% reported by Kelly and Kwast) [15].

The length of time between development of the fistula and presentation to hospital was also considerable in many cases, averaging over 5 years. The occurrence of amenorrhea following the development of a fistula is well known, although whether this reflects the gross tissue loss within the pelvis or a hypothalamic influence as a result of the physical and emotional effects of a traumatic labor, stillbirth and fistula development, is not clear. As the live-birth rate is so low, clearly lactation is unlikely to be a significant factor. Whether the high number of postmenopausal women in this series reflects the effects of obstructed labor on the ovary, with the development of primary ovarian failure, is difficult to judge. In those deemed postmenopausal the average time from the development of the fistula to presentation was over 15 years; it was not possible to judge from the hospital records how many had been amenorrheic since their causative pregnancy. The average time to presentation in those who had resumed menstruation was 51.0 months, compared to 23.4 months in those who remained amenorrheic. This might be taken to imply that the natural history of the hypothalamic suppressive effect of the development of a fistula tends towards spontaneous resolution after 2 years, even if the fistula remains untreated. Alternatively, however, these findings may

simply reflect the fact that the more dramatically affected patients, who are more likely to develop amenorrhoea, are also more likely to present earlier for treatment than their less traumatized sisters who may have resumed menstruation at any stage.

As alluded to above, the assessment of surgical cure in this environment is difficult, as patients, especially those traveling long distances, rarely returned for follow-up. For the purposes of this study, cure has been defined as the point at which patients were subjectively dry at their last assessment, and subsequently underwent no further surgery within the study period. One has to accept that there may be some patients who had persistent fistulae but who did not return to the unit. Given the nature of the condition, and the relationships developed between patients and staff, the fact that patients were rarely happy to leave the site unless they were fully continent, and the availability of a postoperative hostel on site, this number is likely to be small. Nevertheless, cure calculated on this basis must inevitably represent an over- rather than an underestimate of the true cure rate.

The surgical outcome in this series is similar to other large series of obstetric fistulae. Kelly and Kwast reported an 88% cure rate, with 6.2% of patients having residual stress incontinence [15]. Cure at first operation has been looked on as the most appropriate outcome measure by which to judge fistula surgery. It is clear from the current series that in fistula surgery, as in other aspects of surgical practice, the first attempt at treatment gives the optimal result, with 81.2% cured at their first operation, but only 65% of those who required two or more procedures being cured by each successive attempt. We feel that this emphasizes the argument for specialist management where this is available, and for the establishment of fistula units for the provision of both service and training of indigenous doctors in fistula surgery [16–18].

Conclusions

The type and distribution of fistulae recorded in this series is consistent with previous series of largely obstetric fistulae from the developing world. Surgical cure rates are also comparable. The epidemiologic background is at variance with previous reports in several respects, notably that patients were older, of higher parity, higher literacy, and marital support, and more often delivered in hospital than previous series from other parts of Nigeria, and elsewhere in the developing world. Why patients in this area should have such a high fistula rate despite these factors remains uncertain, although this may reflect biosocial differences in the population studied.

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EDITORIAL COMMENT: The authors present their experience with urogenital fistula repair for a large series of patients in Nigeria. It remains an unfortunate fact that the present study reveals no improvement in the incidence of urogenital fistula in this area of world compared to previous reports. Perhaps even more discouraging is the evidence that the patient population seems to be older, to have a higher degree of education and a higher incidence of operative delivery with no great improvement in the overall outcome. Greater efforts are needed to fully correct the plight of laboring women in underdeveloped countries, if the incidence of postdelivery vesicovaginal fistula is to be reduced.