

Obstetric urinary fistulas in KwaZulu-Natal – what is the extent of this tragedy?



S Ramphal, MB ChB, Dip Mid COG, FCOG

G Kalane, MB ChB, FCOG

Department of Obstetrics and Gynaecology, Nelson R Mandela School of Medicine, University of KwaZulu-Natal, Durban

T Fourie, MB ChB, MMed

Department of Urology, Nelson R Mandela School of Medicine, University of KwaZulu-Natal

J Moodley, MB ChB, FRCOG, FCOG, MD

Department of Obstetrics and Gynaecology and Women's Health and HIV Research Group, Nelson R Mandela School of Medicine, University of KwaZulu-Natal

Background. This study describes the demographics and clinical characteristics of women with obstetric fistulas attending the urogynaecological unit at King Edward VIII Hospital (KEH), KwaZulu-Natal (KZN), South Africa.

Method. A prospective clinical review of all women admitted with the diagnosis of an obstetric fistula at KEH from 1999 to 2003.

Results. A total of 41 cases from the rural areas of KZN and the Eastern Cape were identified. The mean age was 29 years (range 15 - 51 years), and 21 were primigravidas, 14 of whom had unplanned pregnancies. All were from low socioeconomic backgrounds and had limited or no access to antenatal care, either due to their social circumstances or to lack of health care facilities. The duration of labour was prolonged in all; there were 5 live births, and 2 neonatal deaths.

Conclusion. Obstetric fistulas are still common in KZN and the Eastern Cape, and occur mainly in women from rural areas.

Globally a woman dies in pregnancy or childbirth every minute, and for each death, 20 - 30 others survive with significant morbidity, including obstetric urinary fistula (OUF).¹ Over 80% of cases of urinary fistula result from neglected labour, mainly in under-resourced countries, and they are a significant cause of physical and psychological disability.²⁻⁴ In addition, they result in social stigmatisation and its consequences.

The true magnitude of the problem of OUF in under-resourced countries is unknown, although a survey by the World Health Organization in 1991 identified virtually all of Africa and South Asia as areas of high prevalence.⁵ Annual figures of 50 000 - 100 000 are estimated globally, and the number of untreated vesico-vaginal fistulas (VVF) is estimated at 500 000 to 2 million.⁶ Data on OUF in KwaZulu-Natal (KZN), South Africa, a province with a population of approximately 9 million, most of whom live in rural undeveloped areas, are lacking. The aim of this study was to evaluate the 'patient profile' of women presenting with OUF to the urogynaecological unit at King Edward VIII Hospital (KEH), the main teaching hospital in KZN.

Methods

Institutional ethical approval was obtained and the clinical data of all women who were admitted with a diagnosis of VVF from 1999 to July 2003 were documented. Clinical and demographic information was documented on a structured data sheet. Clinical data on the index pregnancy included the place and mode of delivery, and in the case of emergency caesarean section (CS), the stage of labour at which the operation was performed and any complications arising from the surgery. The date of diagnosis of the fistula, reasons for delay in seeking help, the date of repair of the fistula, the number of attempts and surgical outcome were also noted. Other information included the availability of transport and health services in the area.

For descriptive purposes OUFs were categorised into simple VVF, complicated VVF, and vesico-uterine fistulas. Successful repair was defined as continence.

All results are presented as frequencies, means and percentages.

Results

Forty-one women with OUF were seen during the study period (Table I). All were black, 14 were younger than 18 years, and most lived in rural areas (18, 43.9%) and semi-rural areas (22, 53.6%) in the provinces of KZN and the Eastern Cape. Only 1 patient lived in an urban area.

Table I.	Patient data (N=41)
Age (years) (mean (range))	29 (15 - 51)
Parity (mean (range))	3 (1 - 8)
Married (N)	1
Fetal outcome	5 born alive, 2 neonatal deaths
Height (cm) (mean (range))	144.6 (118 - 168)
Weight (kg) (mean (range))	48.2 (38 - 80)

Forty were unemployed and lived with their families, surviving on welfare grants. Only one was married and employed as a domestic worker. Thirty-five had primary school education, 5 no formal education and 1 secondary education.

None of the women had their own transport; 8 had no access to emergency transport, and 20 had access to public transport, which was not available after 'working hours'. The majority (25/41) had to travel more than 20 km to access a health care facility.

Twenty-two women (53.7%) were aware of the existence of community health care centres in their area and 8 (20%) were aware of district hospitals; 11 denied awareness of any health care facility in their area.

Only 11 women (26.8%) had received antenatal care at local community clinics or district hospitals.

Twenty-one women (51.2%) were primigravidas, 6 were para 2, 10 para 3, and the rest parity >5.

Nineteen women (46.3%) delivered at home, 17 (41.5%) at district hospitals, 3 (7.3%) at regional hospitals and 2 (4.9%) at tertiary hospitals. Three had hysterectomies following obstructed labour, complicated by postpartum haemorrhage in 2 cases and a ruptured uterus in 1.

Mode of delivery and fetal outcome (Table II)

Labour, in particular the second stage, was prolonged in 40/41 women. There was a stillbirth rate of 87.8%, and of the 5 babies born alive, 2 died within 14 days of delivery.

Forty women cited lack of transport as a major factor in delay in seeking medical care during labour. None admitted to 'cultural reasons' for persevering with a vaginal delivery.

The time of diagnosis of the fistula was variable, ranging from during labour to 4 months after delivery. Two patients with ruptured uteri had bladder involvement, and urinary leakage was detected following hysterectomy and repair of the bladder. In another 2 in whom total abdominal hysterectomy was done for puerperal sepsis,

Table II.	Mode of delivery
Forceps	6
Ventouse	2
Caesarean section	14
Symphysiotomy	2
Vaginal delivery	17

urinary leakage was noted postoperatively. Of the 6 who underwent forceps delivery, urinary leakage was noticed in 4 immediately after delivery, and in the other 2 the diagnosis was made shortly thereafter. The majority of the fistulas (32/41) were diagnosed within the first week following delivery. Three of the 4 women with VVF and 1 with uretero-uterine fistula noticed urinary incontinence 6 weeks after CS.

Details of the fistulas (Table III)

The level of the fistula was variable and included the bladder neck, trigone and urethra. The bladder neck and trigone was the most affected site, followed by the bladder neck and urethra. Other areas affected included the bladder neck alone or various combinations such as vesico-uterine and uretero-uterine. One patient developed a uretero-utero vaginal fistula following an emergency CS (Table III).

Table III.	Level of the fistula
Vesico-vaginal fistula	22
• High lesion (above the trigone)	8
• Low lesion (trigone and below)	14
Complicated fistula	14
• Bladder neck, urethra	5
• Trigone, bladder neck and urethra	9
Vesico-uterine fistula	4
Uretero-utero vaginal fistula	1

Eleven patients had undergone previous unsuccessful attempts to repair the fistula, 5 at district hospitals and 6 at regional hospitals. Seven had undergone one attempt at repair, 2 two attempts, and 2 three attempts.

The route of repair done in the urogynaecological unit was abdominal in 26 cases and vaginal in 13, while 2 patients had a combined approach. Of the patients 12 were operated on by a urologist, 10 by a gynaecologist, and the remainder by both.

'Simple' fistulas comprised 22 cases, of which 8 were high lesions (above the trigone) and 14 low lesions involving the trigone area and below. Four had had previous repairs, and the route of repair was vaginal in 9 cases and abdominal in 13.

'Complicated' fistulas. Fourteen patients fell into this category. In all cases labour had been prolonged, and all had extensive fistulas involving the trigone, bladder neck and proximal urethra. In 3 cases ureteric implants were performed because of close proximity of the fistula edge to the ureters.

Three women in whom primary surgery at other hospitals had failed and another with 'irreparable' damage

(no previous surgery) underwent urinary diversion procedures, namely the Mainz-2 recto-sigmoid pouch procedure (uretero-sigmoidostomy); successful repair was achieved in all 4.

Vesico-uterine fistulas occurred in 4 patients, all of whom had CS. All had successful repairs. The patient with the uretero-utero vaginal fistula had had a previous CS; an emergency CS resulted in fistula formation. Ureteric re-implantation and repair was successful in this patient.

Of the patients 66% defaulted or were lost to follow-up 6 months after surgery.

Discussion

Since the advent of caesarean section, OUFs are rare complications in well-resourced countries, but they still remain a major problem in under-resourced countries, particularly Africa and South Asia.^{2,4}

With an annual delivery rate of approximately 100 000 in KZN, the frequency of OUF in the present survey is low compared with that reported from other countries in Africa such as Nigeria, where the reported fistula rate is 350/100 000.⁷ Our low figure reflects cases repaired at a tertiary hospital and is probably not the true incidence, as many fistulas are successfully repaired in district and regional hospitals in KZN. It may also be due to the fact that South Africa is a middle-income country and health care facilities, particularly in the urban areas, are of a good standard. Facilities in the rural areas are poorer, as can be seen from the fact that the majority of the women with OUF in this series (98%) lived in rural and semi-rural areas. In this setting, delay in accessing a health care facility due to lack of transport was a major problem resulting in prolonged and obstructed labour.

The women in this series tended to be of short stature and 34% had become pregnant before the age of 18 years. Cephalo-pelvic disproportion (CPD) is common in African women. Pelvimetric studies have suggested that pelvices of African women are narrower than those of their European counterparts,⁸ and while growth in respect of height typically stops at menarche, skeletal growth is not complete until the age of 18 years and the bony pelvis is not mature until 20 - 21 years.⁹ The combination of early unprotected intercourse, early pregnancy, small size, short stature and incomplete pelvic growth probably results in CPD and subsequent prolonged labour.

In keeping with the other reports, women in this study were poorly educated and the majority were from a poor rural background.¹⁰⁻¹² There is substantial evidence that the education of women, including public health education and effective contraceptive services, play a major role in promoting maternal and child health, reducing maternal mortality and decreasing the prevalence of fistulas.¹⁰⁻¹²

Traditional surgical practices have also been reported to play a role in the aetiology of OUF. Among some tribes

of Northern Nigeria, '*gishiri*', which is a series of random incisions made in the vagina, using a knife, razor blades or broken bottles in an attempt to overcome obstructed labour and allow delivery, is practised.^{12,13} This practice leads to fistula and vaginal scar tissue formation and infection. To our knowledge, this cultural practice is not performed in South Africa.

In this study, the majority of the fistulas were diagnosed during the first week after delivery. Unlike fistulas after hysterectomy, which result from isolated trauma to otherwise healthy tissue, fistulas that result from obstructed labour are due to a broad field of injury caused by compression of maternal soft tissue between the fetal head and the maternal pelvis. They are mainly the result of ischaemic insult rather than direct injury.¹⁴ During normal labour, the bladder is displaced upwards and the anterior vaginal wall, urethra and bladder base are compressed between the fetal head and the posterior surface of the pubic symphysis. If this compression lasts only a short time it does not cause harm. In prolonged and obstructed labour, however, the tissues are devitalised by ischaemia with resultant necrosis, and the devitalised area sloughs off resulting in fistula formation. The anterior vaginal wall and bladder neck are usually affected, but sometimes the necrosis is higher and the anterior lip of the cervix and trigone may therefore also be involved. The necrotic tissue usually sloughs off between the 3rd and 10th day of the puerperium, resulting in urinary incontinence.⁶

Of concern in this series was the high rate of instrumental intervention ($N=10$). It is well known that instrumental delivery should not be used to override obvious CPD, and although the obstetric records of these patients were not available, it can be assumed that these instruments may have been incorrectly used or may not have been indicated. In the 6 patients who had forceps delivery, the fistula was noticed immediately or shortly after the procedure, suggesting direct injury. Bony pelvic obstruction in African women tends to be more pronounced at the inlet or mid-cavity, and application of forceps in the presence of CPD results in difficult deliveries.¹⁵ Caution should therefore be exercised when deciding to use forceps in such circumstances. Forceps should merely be applied for a 'lift out' when the head is at the perineum. Application of the ventouse contributed to development of a fistula in 2 women in this series. If it is decided to use a ventouse, the rule of '3 pulls' must be adhered to, and like forceps the ventouse should not be used in the presence of overt disproportion.¹⁵ The remaining 2 instrumental deliveries were symphysiotomies performed in rural hospitals for obstructed labour; pressure necrosis rather than poor technique was probably the cause of the fistula, since the onset of urinary incontinence in these cases was delayed. Obstetric fistula resulting from symphysiotomy is uncommon and has been reported in 1.8% of 5 000 such procedures.¹⁶

Four women presented with VVF and 1 with uretero-uterine vaginal fistula following CS. Three of the CSs

were performed in district hospitals where equipment is inadequate and clinicians without operative experience perform difficult emergency CS in the presence of gross CPD. It is possible that these fistulas may be the result of complications encountered during difficult CS rather than direct consequences of prolonged obstructed labour.¹⁷ Danso reported that 36 (22%) of 164 fistulas were due to complications of surgery.¹⁷ In all 5 women in the our study the fistula was diagnosed 6 weeks after CS. There is concern that morbidity, including OUF, and maternal mortality may increase with greater numbers of CSs being performed in under-resourced countries, before provision of proper surgical training, adequate infrastructure and well-trained support staff.

The surgical technique for fistula repair in this series was broadly divided into abdominal, vaginal, or a combination of both. In patients with 'irreparable' fistulas, the Mainz 2 recto-sigmoid pouch operation was used as a urinary diversion procedure.¹⁸ This entails an extended double-fold de-tubularisation of the rectosigmoid (maximising the pressure reduction effect), creating a relatively capacious rectal pouch. The ureters are then dissected and the distal ends implanted in the region of the recto-sigmoid junction.

Generally accepted principles of fistula surgery were followed,¹⁹ namely: (i) wide mobilisation of the fistula, so that it can be closed without tension on the suture line; (ii) closure of the defect in multiple layers whenever possible; (iii) prolonged postoperative bladder drainage to prevent bladder overdistension and rupture of the closure; and (iv) use of pedicled flaps to increase the blood supply to injured, fibrosed tissues and thereby improve wound healing. With simple low vaginal fistulas and vesico-urethral fistulas the vaginal route is preferred, in keeping with worldwide consensus favouring a simple transvaginal approach. Transabdominal operations, which require general anaesthesia, are reserved for high vaginal fistulas, vesico-uterine fistulas, and cases in which a ureteric implant is likely to be necessary.

The ischaemic damage caused by obstructed labour often has a devastating impact on urethral function.^{20,21} Although the bladder-urethral defects were successfully closed, 5 women in our series (12.2%) still had urethral sphincter incontinence because of a shortened, fibrotic urethra due to scar tissue. This compares favourably with other studies in which the reported rate of urethral stress incontinence is as high as 30%.^{20,21} Macroplastique periurethral bulking²² was attempted in 2 cases, resulting in reduction in the number of episodes of stress incontinence but not complete continence. Pubovaginal slings and urethrolyses with vaginal colposuspensions are other options, with guarded results.²³ Development of successful techniques for dealing with persistent transurethral incontinence after successful fistula closure is still a major challenge.

In the case of fistulas due to prolonged obstructed labour where the injury is the result of prolonged ischaemia and tissue necrosis, tissue grafts that bring a new blood supply to the site of repair appear to increase the chance of successful closure.⁶ In this series, the use of omental patches during abdominal procedures²⁴ and Martius bulbocavernosus flaps during vaginal procedures were associated with a

favourable outcome. This is supported by other studies^{25,26} and has resulted in liberal use of these flaps in the surgical treatment of OUF at KEH.

The limitations of this study were that no quality of life evaluations prior to and following repair of the fistulas were undertaken, and no long-term postoperative follow-up was done. Long-term follow-up is difficult in much of Africa as patients need to travel long distances from remote rural areas and do not have access to postal and telephone services. Furthermore, no effort was made to evaluate reintegration and rehabilitation.

Conclusion

Although this is a descriptive study, it identified areas in KZN and Eastern Cape where OUF is prevalent, described the patient profile, and provided an audit of surgical interventions and outcomes. The long-term solution to this problem lies in prevention of prolonged labour and its sequelae by the development of a comprehensive health system and the provision of accessible emergency obstetric care for all pregnant women.

- Lewis G, de Bernis L, eds. *Obstetric Fistula: Guiding Principles for Clinical Management and Program Development*. Geneva: World Health Organization, 2005.
- Abou Zahr C. Obstructed labour. In: Murray C, Lopez A, eds. *Health Dimensions of Sex and Reproduction*. Geneva: World Health Organization, 1998: 243-266.
- Vangeenderhuysen C, Prual A, Ould el Joud D. Obstetric fistulae: incidence estimates for sub-Saharan Africa. *Int J Gynecol Obstet* 2001; 73: 65-66.
- Miller S, Lester F. Obstetric fistula: a preventable tragedy. *J Midwifery Womens Health* 2005; 50(4): 286-294.
- Wall LL, Arrowsmith SD, Briggs ND, et al. The obstetric vesicovaginal fistula in the developing world. In: Abrams P, Cardozo L, Khoury S, Wein A, eds. *Incontinence*. Vol. 2. Management (Report of the 3rd International Consultation on Incontinence). Paris: Health Publications, 2005: 1405-1454.
- Hilton P. Vesico vaginal fistulae in developing countries. *Int J Gynecol Obstet* 2003; 82: 285-295.
- Harrison KA. Child-bearing, health and social priorities: a survey of 22 774 consecutive deliveries in Zaria, Northern Nigeria. *Br J Obstet Gynaecol* 1985; 92(5): 1-119.
- Stewart KS, Cowan DB, Philpott RH. Pelvic dimensions and the outcome of trial labour in Shona and Zulu primigravidae. *S Afr Med J* 1979; 55: 847-851.
- Moerman ML. Growth of the birth-canal in adolescent girls. *Am J Obstet Gynecol* 1982; 143: 528-532.
- Bangser M, Gumodoka B, Berege Z. A comprehensive approach to vesico-vaginal fistula: a project in Mwanza, Tanzania. In: Berer M, Ravindram TKS, eds. *Safe Motherhood Initiatives: Critical Issues*. Oxford: Blackwell /Science, 1999: 157-165.
- Murphy M. Social consequences of vesico-vaginal fistula in Northern Nigeria. *J Biosoc Sci* 1981; 13: 139-150.
- Wall L, Karshima J, Kirschener C, Arrowsmith SD. The obstetric vesicovaginal fistula: characteristics of 899 patients from Jos, Nigeria. *Am J Obstet Gynecol* 2004; 190(4): 1011-1019.
- Tahzib F. Vesicovaginal fistula in Nigerian children. *Lancet* 1985; 2: 1291-1293.
- Arrowsmith S, Hamlin EC. Obstructed labour injury complex: obstetric fistula formation and the multifaceted morbidity of maternal birth trauma in the developing world. *Obstet Gynaecol Surv* 1996; 51(9): 568-574.
- Philpott RH. The recognition of cephalo-pelvic disproportion. *Clin Obstet Gynaecol* 1982; 9(3): 609-624.
- Bjorklund K. Minimally invasive surgery for obstructed labour: a review of symphysiotomy during the 20th century (including 5 000 cases). *Br J Obstet Gynaecol* 2002; 109: 236-248.
- Danso KA. The epidemiology of genitourinary fistulae in Kumasi, Ghana 1977 - 1992. *Int Urogynecol J Pelvic Floor Dysfunct* 1996; 7: 117-120.
- Woodhouse CRJ, Christofides M. Modified ureterosigmoidostomy (Mainz 2) - technique and early results. *Br J Urol* 1998; 81: 247-252.
- Waaldijk K. *Step-by-step Surgery of Vesicovaginal Fistulas*. Edinburgh: Campion Press, 1994: 38-83.
- Hassim AM, Lucas C. Reduction in the incidence of stress incontinence complicating fistula repair. *Br J Surg* 1974; 61: 461-465.
- Hudson CN, Hendrikse JP. An operation for restoration of urinary continence following total loss of the urethra. *Br J Surg* 1975; 82: 501-504.
- ter Meulen PhH, Berghmans LCM, van Kerrebroeck PhEVA. Systematic review: Efficacy of silicone microimplants (Macroplastique) therapy for stress urinary incontinence in adult women. *Eur Urol* 2003; 44: 573-582.
- Carey MP, Goh JT, Fynes NM, Murray CJ. Stress incontinence after delayed primary closure of genitourinary fistula: a technique for surgical management. *Am J Obstet Gynecol* 2002; 186: 948-953.
- Badenoch DF, Tiptaft RC, Thakar DR, et al. Early repair of accidental injury to the ureter or bladder following gynaecological surgery. *Br J Urol* 1987; 59(6): 516-518.
- Rangnekar NP. Role of Martius procedure in the management of urinary-vaginal fistulae. *J Am Coll Surg* 2000; 191: 259-263.
- Leach GE. Urethrovaginal fistula repair with Martius labial fat pad graft. *Urol Clin North Am* 1991; 18(2): 409-413.