

Genital tract fistula: a case series from a tertiary centre in South Africa

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Abstract

Introduction and hypothesis We describe the demographic profile, aetiology, management and surgical outcomes in women with genital tract fistula presenting to a tertiary urogynaecology unit.

Methods This retrospective audit included 87 patients managed in our unit between 2008 and 2015. Frequencies and means with standard deviations are presented for categorical and continuous data. Continuous dependent variables are categorized as above or below the median for bivariate analyses performed using the chi-squared test ($\alpha = 0.05$).

Results The mean age of the women was 34.7 years, 64.4% were Black African, 70.2% were multiparous, 49.4% were married, 82.8% were employed, and 21.8% were HIV-infected, with 47.4% on antiretroviral treatment. Vesicovaginal (47.1%) and rectovaginal (41.4%) fistula were the most frequent injuries. The majority of the injuries (67.8%) were obstetric, with 26.4% occurring during caesarean delivery.

Repair had been attempted previously in 43.7% of patients. In 63.2% of the repairs the approach was vaginal and in 35.6% abdominal. Interposition grafts were used in 23% of repairs. In 85.1% of patients the initial repair at our centre was successful. Patients with multiple repairs were more likely to have complications ($p = 0.03$). HIV infection was not significantly associated with complications.

Conclusions A high rate of successful repair was found, with previous unsuccessful repairs associated with poorer outcomes, highlighting the need for centralized management.

Keywords Fistula · Genital tract · Tertiary centre · Surgical outcomes

Introduction

Genital tract trauma in women results in debilitating, emotional, psychological and social problems, which impacts negatively on the quality of life of affected individuals [1–4]. The anatomical proximity of the bladder, rectum, vagina and uterus make the genital tract susceptible to trauma during complicated childbirth and difficult gynaecological surgery [1, 5, 6]. The resultant fistula, with associated urinary or anal incontinence are a major health problem in women across all economic and social divides. A genital tract fistula is an opening between a woman's genital tract and either the urinary (ureter, bladder or urethra) or the intestinal (rectum) tract [1, 4, 7, 8]. In resource-constrained settings these injuries are mainly of obstetric origin, whereas in well-resourced settings, gynaecological surgery and radiotherapy account for the majority [3–6, 8–10]. It has also been shown that repair is more likely to be successful if the patient has not been operated upon prior to referral to a specialist centre [3, 5].

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While prevalence estimates in sub-Saharan Africa vary between 1 and 1.6 per 1,000 [4] or 33,000 cases annually [8], there is little evidence regarding genital tract fistula in South Africa [11], where the quality of healthcare varies between first-world (private) and third-world (public) facilities. At our tertiary centre, patients with genital fistula are referred from both the private sector and public sector, many after failed surgery at their referral centre. The causes of the genital tract trauma vary between obstetric and elective gynaecological procedures. Hence we decided to carry out this audit, the aim of which was to describe the demographic profile, aetiology, management and surgical outcomes in women with genital tract fistula referred to our tertiary unit, many after failed repair attempts.

Materials and methods

Study design

This was a retrospective audit of patients presenting to the Urogynaecology Unit of Greys Hospital in Pietermaritzburg, South Africa, over an 8-year period (2008–2015) for management of genital fistula. The standard management at the tertiary centre was a complete assessment of the injuries, under anaesthesia if necessary, appropriate investigations, treatment of any infections, surgical treatment and follow-up at 2 weeks, 6 weeks and 3 months after surgery. Patients were also advised to return immediately if symptoms recurred.

Data collection

Demographic, clinical presentation, management and outcome data were collected following record reviews using a data extraction sheet. Demographic data included race, age, marital status, parity, level of education and professional status. Clinical data included aetiology of the injury, the timing of diagnosis, the type of health facility where the injury occurred, and if previous repairs had been attempted prior to referral. If the primary cause was obstetric, the mode of delivery, whether vaginal, instrumental or caesarean (C/D), was recorded. In the case of C/D the experience of the surgeon and any complications at the time of the elective or emergency surgery were recorded. If the fistula followed gynaecological surgery, the route and nature of the procedure were recorded. The characteristics of the injuries, timing of referral to the tertiary centre, technique of repair, number of attempts, and surgical outcome were also noted.

The genital fistula were categorized into urogenital fistula (UGF), comprising vesicovaginal (VVF), vesicouterine, ureterovaginal, urethrovaginal and rectovaginal (RVF) fistula. A successful repair was defined as the lack of clinical

evidence of persistence or recurrence of the fistula at 3 months postoperatively.

Data analysis

Data captured in Microsoft Excel were analysed in SPSS version 23 (IBM Corp., Armonk, NY). Frequencies and means with standard deviations are presented for categorical and continuous data. Continuous dependent variables are categorized as above or below the median for bivariate analysis performed using the chi-squared ($\alpha = 0.05$).

Regulatory approvals

Provincial and institutional approval was obtained from the relevant authorities prior to commencing data collection. Confidentiality was maintained at all times and the principal investigator was responsible for capturing all data.

Results

The study group comprised 87 patients with genital fistula managed in our centre between 2008 and 2015. The mean age of the patients was 34.7 years (SD 13.2 years). The majority were Black African (64.4%), 49.4% were married, 82.8% were employed, 70.2% multiparous (Table 1), and 21.8% were HIV-infected, with 47.4% on antiretroviral treatment. The mean CD4 cell counts at initial referral and surgery were 438.7 cells/ μ L (SD 234.1 cells/ μ L) and 454.8 cells/ μ L (SD 214.6 cells/ μ L), respectively (Table 2).

Most referrals were from district and regional hospitals (35.6% and 32.2%, respectively). In-house referrals accounted for 2.3% of patients, while 19.5% of patients came from private health institutions (Table 3). The primary cause of injury in patients from district hospitals was obstetric, as compared with gynaecological surgery in those from regional hospitals. Significantly more patients with RVF were referred from district hospitals ($p = 0.04$). In most patients (42.5%) the injury was detected immediately following delivery or surgery, and in 24.1% detection was delayed. In 43.7% of patients there had been failed repair attempts prior to referral (Table 3). Patients were most frequently referred with VVF (47.1%) and RVF (41.4%; Table 4)

In 88.5% of patients the fistula was a single injury, in 82.9% the fistula was between 1 and 5 cm in size, and in 71.3% scarring was mild to moderate. In 45.1% of patients with a UGF, the lesion was low (trigone and lower), and in 37.3% the lesion was high (above the trigone). The primary cause of injury was obstetric (67.8%), with 24.1% following vaginal delivery. Instrumental deliveries accounted for 14.9% of the obstetric injuries, while emergency and elective C/D accounted for 20.7% and 5.7% of the obstetric injuries, respectively. Of the non-obstetric fistula, gynaecological

Table 1 Demographic profile of 87 patients presenting with genital tract fistula and perineal injuries to a tertiary centre in South Africa, 2008–2015

Demographic characteristic	Value
Race, <i>n</i> (%)	
Black	56 (64.4)
Indian	14 (16.1)
White	13 (14.9)
Coloured	4 (4.6)
Age (years)	
Minimum	15
Maximum	73
Mean (SD)	34.7 (13.2)
Marital status, <i>n</i> (%)	
Married	43 (49.4)
Divorced	15 (17.2)
In a relationship	9 (10.3)
Single	20 (23.0)
Parity, <i>n</i> (%)	
0	1 (1.1)
1	25 (28.7)
2	26 (29.9)
3	16 (18.4)
4	14 (16.1)
5	4 (4.6)
8	1 (1.1)
Professional status, <i>n</i> (%)	
Professional	9 (10.3)
Skilled	21 (24.1)
Unskilled	32 (36.8)
Labourer	10 (11.5)
Housewife	15 (17.2)
Education, <i>n</i> (%)	
Tertiary	8 (9.2)
Secondary	55 (63.2)
Primary	22 (25.2)
Pre-primary	2 (2.3)

surgery was the most frequent cause (23%), and the 1.1% of the fistula occurred spontaneously (Table 4). The level of training of the surgeon, type of anaesthesia and complications during C/Ds are shown in Table 5, and the nature and type of gynaecological surgery are shown in Table 6. Medical officers performed 75% of the causative C/Ds, while 65% of the causative gynaecological procedures were elective.

All 87 patients were managed surgically at our centre. In 63.2% the surgical approach was vaginal, and in 35.6% the approach was transabdominal. Of the VVFs, 19 (37.3% of all UGFs) were repaired via the vaginal approach. Thus, all UGFs other than VVFs were addressed transabdominally. An omental interposition graft was used in 23% of patients. In 55.2% of patients, the ureters were stented intraoperatively,

Table 2 HIV status in the 87 included patients

	Value
Status, <i>n</i> (%)	
Uninfected	68 (78.2)
Infected	19 (21.8)
On antiretroviral treatment	9/19 (47.4)
Not on antiretroviral treatment	10/19 (52.6)
CD4 cell count (cells/ μ L), mean (SD)	
At presentation	438.7 (234.1)
At surgery	454.8 (214.6)
Postsurgical sepsis in infected patients ^a	
Yes	2/18 (10.5) ^b
No	16/18 (84.2)

^a One HIV-positive patient was lost to follow-up

^b 18.2% of all patients with sepsis were HIV-positive

Table 3 Data obtained at referral in the 87 included patients

	Value
Referral site, <i>n</i> (%)	
Rural clinic	7 (8.0)
Urban clinic	2 (2.3)
District hospital	31 (35.6)
Regional hospital	28 (32.2)
Tertiary hospital (in-house)	2 (2.3)
Private hospital	17 (19.5)
When injury detected, <i>n</i> (%)	
At the time of delivery/surgery	12 (13.8)
After delivery/surgery (\leq 1 week)	25 (28.7)
Delayed	21 (24.1)
Missing	29 (33.3)
Time to presentation at tertiary centre	
<1 month	11 (12.6)
1–3 months	26 (29.9)
4–6 months	28 (32.2)
7–12 months	7 (8.2)
13 months- to 2 years	3 (3.4)
>2 years	12 (13.8)
Repaired previously	
Yes	38 (43.7)
No	49 (56.3)
Timing of previous repair	
At the time of injury	19/38 (50)
Delayed	19/38 (50)
No. of repairs	
1	24 (63.2)
2	9 (23.7)
3	5 (13.2)

The values presented are number (%) of patients

Table 4 Characteristics of Injury in the 87 included patients

	<i>N</i> = 87 (%)
Type of fistula	
Vesicovaginal	41 (47.1)
Ureterovaginal	6 (6.9)
Urethrovaginal	2 (2.3)
Vesicouterine	1 (1.0)
Vesicovaginal and ureterovaginal	1 (1.1)
Rectovaginal	36 (41.4)
Rectovaginal and vesicovaginal	1 (1.1)
Grade of injury: size (cm)	
<1	10 (11.5)
1–3	36 (41.4)
3–5	37 (42.5)
>5	4 (4.6)
Grade of injury: scarring	
None	6 (6.9)
Mild	24 (27.6)
Moderate	38 (43.7)
Severe	19 (21.8)
Grade of injury: number	
Single	77 (88.5)
Multiple	10 (11.5)
Cause of injury	
Obstetric	59 (67.8)
Non-obstetric	28 (32.2)
Causes of obstetric injuries	
Vaginal delivery	21 (24.1)
Vaginal delivery + episiotomy	1 (1.0)
Instrumental delivery	13 (14.9)
Emergency caesarean section	18 (20.7)
Elective caesarean section	5 (5.7)
Causes of non-obstetric injuries	
Gynaecological surgery	20 (23.0)
Malignancy	2 (2.3)
Radiotherapy	4 (4.6)
Infection	2 (2.3)
Spontaneous	1 (1.1)

The values presented are number (%) of patients

with the stents being left in for 6 weeks in 34.5% of patients. In one patient a urostomy was created for a large VVF following repeated failed repair attempts. All RVFs were repaired vaginally, with 9.2% requiring a colostomy, two of which were permanent (Table 7).

The initial surgical repair was successful in 74 patients (85.1%), with 12.6% requiring a second repair and 2.3% requiring three or more attempts. Those patients with multiple repairs were more likely to show complications ($p = 0.03$), with the repair breaking down in 10.3% of patients, and sepsis as a

Table 5 Characteristics of the 24 caesarean deliveries causing fistula

Characteristic	Value
Level of training of surgeon	
Medical officer	18 (75)
Registrar	4 (16.7)
Specialist	2 (8.3)
Type of anaesthesia	
Regional	16 (66.7)
General	8 (33.3)
Complications during surgery	
Bleeding	8 (33.3)
Tear	2 (8.3)
Impacted presentation	10 (41.7)
Compound presentation	1 (4.2)
Adherent placenta	2 (8.3)
Extensive adhesions	1 (4.2)

The values presented are number (%) of patients

complication in 11.5%. Some form of urinary incontinence (stress, urge or mixed) occurred in 13 patients (14.9%) after repair. HIV infection did not have a significant impact on the complication rate, with only 10.5% of infected patients developing sepsis (18.2% of all patients with sepsis; Table 2).

Discussion

There is currently no national policy regarding funding of, or recognition of specialized fistula centres in South Africa; however, we describe here the workload of a tertiary fistula service. Whilst the findings of this study may not necessarily reflect the whole of South African practice, it highlights the characteristics and management outcomes in patients with genital tract injuries seen at our unit. The unit caters for

Table 6 Characteristics of the 20 gynaecological procedures causing fistula

Characteristic	Value
Nature of surgery	
Elective	13 (65)
Emergency	6 (30)
Oncology	1 (5)
Type of surgery	
Abdominal	9 (45)
Vaginal	8 (40)
Urogynaecological	3 (15)
Peripartum emergency hysterectomy	5 (25)

The values presented are number (%) of patients

Table 7 Surgical procedures and outcomes at the tertiary centre

	Value
Surgical approach	
Vaginal	55 (63.2)
Abdominal	31 (35.6)
Vaginal and abdominal	1 (1.1)
Examination under anaesthesia/cystoscopy	
Yes	52 (59.8)
No	35 (40.2)
Stenting of ureters	
Yes	48 (55.2)
No	34 (44.8)
Stents in for 6 weeks	
Yes	30 (34.5)
No	57 (65.5)
Ureteric reimplantation	
Yes	8 (9.2)
No	79 (90.8)
Fat pad/omental graft	
Yes	20 (23.0)
No	67 (77.0)
Diversion	
Yes	8 (9.2)
No	79 (90.8)
Type of diversion	
Colostomy	8 (9.2)
Urostomy	1 (1.1)
No. of repairs at centre	
1	74 (85.1)
2	11 (12.6)
3 or more	2 (2.3)
Complications	
Breakdown	9 (10.3)
Sepsis	10 (11.5)
None	66 (75.9)
Breakdown and sepsis	1 (1.0)
Incontinence	13 (14.9)
Lost to follow up	1 (1.0)

The values presented are number (%) of patients

patients from 12 district and 3 regional facilities, as well as private facilities within the area. In contrast to the women in other reports from resourced-constrained settings [1, 2, 10, 11], women in this series were older, and more likely to be married and well educated. The majority of injuries followed childbirth, with gynaecological surgery accounting for many of the non-obstetric injuries. These findings, in keeping with those of studies from well-resourced countries and specialized referral centres [3, 5, 6, 9], may be more representative of the

patients referred to our unit, i.e. from both public and private health facilities. Obstetric fistula generally occur in women who are younger, poorly educated and from poor socioeconomic backgrounds [1, 2, 7, 11, 12]. Maheu-Giroux et al. [4] stated that improved literacy, older age at first intercourse or childbirth, and improvements in access to quality sexual and reproductive healthcare are required to end fistula in sub-Saharan Africa. In well-resourced countries, with easy access to emergency obstetric care and improved obstetric facilities, UGFs are usually associated with gynaecological and pelvic surgery, especially hysterectomy [5–7, 9].

In this series childbirth-related injuries usually followed vaginal delivery, with C/D or instrumental delivery accounting for the rest. These findings are in keeping with studies involving obstetric fistula from low-income and middle-income countries [1, 2, 4, 6, 8–11], and differ from those carried out in well-resourced settings which show that obstructed labour accounts for a minority of obstetric injuries, with operative deliveries accounting for the majority [3, 5].

The majority of childbirth-related injuries were in patients referred from district health facilities, which are staffed by medical officers without much obstetric experience and most deliveries are conducted by midwives. Lack of proper infrastructure and insufficient equipment further compound the problem. Apart from difficult vaginal deliveries, these injuries may be the result of complications encountered during difficult C/Ds or instrumental deliveries. Raassen et al. [7] in their multicentre study in Africa found that four out of five iatrogenic fistula followed surgery for obstetric complications. In keeping with studies from other specialized centres [3, 5–7, 9], we found that most injuries in patients referred from regional centres followed gynaecological surgery, usually hysterectomy. As discussed by Hilton [5] and Raassen et al. [7], this may be due to poor or declining standards of surgical training and practice in gynaecology, or that the patients in our regional health facilities present with more complex pathology.

Most injuries were detected at the time of the primary insult or within a week thereof, with the remaining patients being diagnosed between a week and 2 years later. Ramphal et al. [11] found that the majority of fistula were diagnosed within the first week following delivery, while Singh et al. [6] found that the development of VVF following obstructed labour ranged from 5 to 38 days, and iatrogenic VVF presented with leakage of urine within 13 days. Hilton [5] found that those women with a posthysterectomy fistula developed leakage of urine between 3 days and 8 weeks after surgery, while Raassen et al. [7] found in their series that leakage developed between 2 and 7 days.

It is likely that extremely late or delayed fistula development represents delayed presentation of the patient to the health facility. Muleta et al. [2] found that primi- and multiparous women presented with fistula after an average of 7 and 8 months, while Goh [10] found that 60% of women presented

in the first 6 months after the occurrence of the fistula and 20% presented after 12 months. Naru et al. [9] found that presentation varied from 1 month to 35 years (median 1.5 years). Differences in the patient profile and primary cause may also explain these findings. Gynaecology patients (generally self-referrals) have an established relationship with their medical team and hence will seek help earlier. Obstetric patients, on the other hand, are usually emergencies at the time of the initial operative procedure and may not be followed up or discharged by the same medical team. Furthermore, many obstetric fistula may be due to pressure necrosis, hence the delayed presentation.

Presentation to our unit varied from less than a month after diagnosis to over 2 years. This may have been either due to late presentation to our referral centres, or as a result of delay due to attempted management at these centres (43.1% of patients). The high incidence of failed repairs raises the question as to whether these centres should be carrying out these repairs in the first place. Reisenauer [3] also found that 26.8% of the women referred to their tertiary centre had recurrent fistula after one to six previous repair attempts. Evidence suggests that management of these patients should be undertaken by surgeons with appropriate training and experience, working in specialized centres [3–6, 9].

Practice regarding the surgical management of fistula varies. The timing of the repair (early or late) often creates a dilemma, especially given the current lack of consensus regarding the definitions of early (1 to 3 months) and late (2 to 4 months) repairs [13]. In specialized units repairs are undertaken as soon as the tissues appear uncontaminated [3, 5, 14]. In our series, timing of repair varied considerably because most patients were referrals; however, the majority were done between 1 and 6 months. It has been suggested that late repairs (after 3 months) may be more appropriate in iatrogenic fistula, but studies have shown no difference in outcome between early and late surgical repair of iatrogenic fistula [5, 13, 15, 16]. We saw no difference in outcome between patients who underwent surgery in the first 3 months and those who had late repairs.

The approach and technique of repair also vary, with urologists favouring an abdominal approach, and most gynaecologists, especially those with experience of obstetric fistula repair preferring the vaginal route. The location of the fistula, its relationship to the ureteric orifices, the complexity of the fistula and the time to repair after its formation all determine the choice of route [3, 5, 6, 9, 11, 12]. In our centre we prefer the vaginal approach, although this may not always be possible given the complexity of the fistula in some of the patients. The advantages include reduced blood loss, fewer complications, early mobilization and reduced hospitalization. The transabdominal approach is used when the fistula is located high, is complex, involves the ureter, requires ureteric reimplantation or involves the uterus, or if there have been multiple failed previous surgical interventions. An initial examination under anaesthesia may be advisable in deciding on the appropriate surgery in certain patients.

We practice generally accepted principles of fistula surgery when managing UGFs and RVFs, with wide mobilization of the fistula, resection of all devascularized and fibrous tissue, good haemostasis, and tension-free closure of the defect in multiple layers [3, 5, 6, 9, 10]. Initially in those patients with large and complicated fistula (extensive scarring or repeated breakdown) we used interposition grafts (23%); however, this is no longer our practice. The use of interposition grafts is contentious, with some studies showing improved cure rates with their use [17, 18] and others showing no difference in outcome, and with a move away from their use amongst obstetric fistula surgeons [5, 10, 11]. We address ureteric fistula by means of a ureteroneocystostomy using an antireflux technique either directly into the bladder or into a Boari flap. In those patients in whom the fistula is close to a ureteric orifice, ureteral stents are inserted and left in situ for 6 weeks postoperatively. All patients have prolonged postoperative bladder drainage. In patients with multiple failed attempts to repair a RVF we perform a colostomy, with closure of the fistula 6 weeks after the colostomy procedure and reversal of the colostomy once the repair is deemed successful. Other authors describe similar principles of management [19–21].

We had a high rate of successful repair at the first attempt, even in those patients with failed repair attempts prior to referral. Many of the primary failures at our centre were more likely to involve those patients with failed attempts prior to referral, and these women were likely to have lower secondary closure rates. Other series have shown similar findings [3, 5, 6, 9, 11]. The presence of urinary incontinence in our patients after repair highlights the fact that a successful closure does not necessarily equate to functional success. The persistence of urinary incontinence after anatomical closure of obstetric fistula has been described [2, 5, 8, 10–12, 22].

We found no significant association between HIV infection and sepsis after repair. This could be attributed to the fact the mean CD4 cell count in our patients was 453.95 cells/ μ L. Evidence suggests that CD4 cell counts below 200 cells/ μ L are associated with an increased incidence of postsurgical complications [23, 24].

Limitations

This was a retrospective review of routinely collected data, and thus we present the findings only for available patients and had no information on patients who may have been managed at district hospitals. Much of the information recorded was provided by the women themselves and may be subject to recall bias. The data does not lend itself to any further analysis beyond that of a descriptive nature. Even though patients were seen at 2 weeks, 6 weeks and 3 months, no trend analysis was possible with respect to the extent of improvement in symptoms.

Conclusions

This study demonstrated high rates of successful repair despite varying aetiologies. It is evident that the best chance of a successful surgical outcome is at the first attempt, undertaken by someone with the necessary skill and expertise, highlighting the need for these patients to be managed in specialized centres. Although the primary cause of genital tract trauma was obstetric, gynaecological surgery tended to be a major contributor at regional centres drawing into question current training and practice in gynaecology. Personnel performing obstetrics and gynaecology procedures must be competent. Training together with mentoring and continuous supervision is necessary.

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Compliance with ethical standards

Conflicts of interest None.

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