

The medium- to long-term functional outcomes of women who have had successful anatomical closure of vesicovaginal fistulae

Mandeep Grewal, Mahreen Hussain Pakzad, Rizwan Hamid, Jeremy Louis Ockrim, Tamsin Jillian Greenwell

Department of Urology, University College London Hospital, London W1G 9PH, UK

Abstract

Context: While much has been published on vesicovaginal fistula (VVF), little is known about the urinary, bowel, and sexual functional outcomes following successful anatomical closure.

Aims: We assessed the medium- to long-term urological, sexual, and bowel function outcomes following the successful anatomical closure of VVF.

Patients and Methods: We conducted interviews with 36 women (median age – 47.5 years) who had successful anatomical closure of their VVF (28 vaginally and 8 abdominally) with a median of 40.5 months earlier. All completed validated questionnaires on urinary (Urogenital Distress Inventory-6 [UDI-6] and Incontinence Impact Questionnaire-7 [IIQ-7]), bowel (low anterior resection syndrome [LARS] score), and overall function (EQ5D). Sexually active patients completed the pelvic organ prolapse/ urinary incontinence sexual questionnaire (PISQ-12). All women also completed these questionnaires retrospectively for their status immediately before VVF repair. Functional outcomes were compared with preoperative function, and outcomes of those women having vaginal repair were compared with those having abdominal repair. Statistical analysis was by Student's *t*-test and Mann–Whitney U-test.

Results: Median UDI-6 and IIQ-7 scores (low score is better) reduced significantly ($P \leq 0.01$) from 16.5 and 25.5 preoperatively to 4 and 2.5 postclosure. Median LARS score was not significantly altered. Sexual function was restored in 67.6% while overall function postclosure was good (PISQ12 – low score better). Both EQ5D (low score better) and health thermometer (high score better) medians were significantly improved ($P < 0.01$) from 9 and 25 to 6 and 75 postclosure, respectively. There was no significant difference in the medium- to long-term outcomes of women who had had vaginal repair of their VVF and those who had had abdominal repair.

Conclusions: Successful repair of VVF results in medium- to long-term significant improvement in urinary symptoms and distress, general well-being, and quality of life with no long-term adverse effects on bowel function regardless of route of repair. Sexual function is restored in 67.6%.

Keywords: Bowel, long-term function, sexual, urinary, vesicovaginal fistula

Address for correspondence: Ms. Tamsin Jillian Greenwell, Department of Urology, University College London Hospital, 16-18 Westmoreland Street, London W1G 9PH, UK.

E-mail: tamsin.greenwell@nhs.net

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INTRODUCTION

Vesicovaginal fistula (VVF) is an abnormal epithelial-lined communication between the vagina and urinary bladder. It is mostly a problem of developing nations, arising as a devastating complication of poorly managed (second stage) labor and far less commonly gynecological surgery.^[1,2] As a result of generalized access to obstetric services, obstructed vaginal delivery is a rare cause of VVF in high-income countries – being causative in a maximum of 8%^[3,4] as compared to being the cause in up to 97% of VVF in the resource-poor countries.^[5,6]

The most common cause of VVF in high-income countries is bladder injury at the time of gynecological, urological, or other pelvic surgical procedures.^[5-7] Hysterectomy, in its various forms, is the precipitating surgical cause in-between 63% and 91%.^[5-7] The incidence of VVF following hysterectomy overall has been calculated as 0.001%–0.2%.^[8,9] The UK incidence of VVF intervention has been steady with 115 repairs performed in 2005–2006 and 100 in 2014–2015.^[3]

VVF, generally, presents with significant and continuous urinary incontinence. While much is published on anatomical closure and urinary continence rates immediately following anatomical closure, little is known about long-term functional outcomes. We have assessed the quality of life and urological, sexual, and bowel functions in women having successful anatomical closure of their VVF at a median of 40.5 months postclosure.

PATIENTS AND METHODS

Sixty-seven women were referred for management of their VVF to a single surgeon between 2005 and 2015. Four VVF spontaneously resolved following 12 weeks of urethral catheter drainage. Four women with postradiotherapy VVF were deemed unreconstructable and proceeded to primary diversion (2 ileal conduits and 2 neobladder/Mitrofanoff) and 1 patient with a postradiotherapy fistula was not fit for any surgical intervention due to general poor health status. The remaining 58 women of median age 47 years (range 26–84) had successful anatomical closure of their fistula by a single surgeon between 2005 and 2015. Two of these women (3.5%) required a second procedure to achieve definitive anatomical closure.

At the time of this review, 5 of the women had died from recurrent cancer (2 from transitional cell carcinoma and 3 from cervical carcinoma), 12 were uncontactable despite multiple attempts, and 5 did not speak English as

their first language and were unable to proceed with our assessments. The remaining 36 (63%) women of median age 47.5 years (range: 25–69 years) were contacted through telephone or in-person interviews as part of their ongoing routine follow-up at a median of 40.5 months (range: 9–138) following the successful anatomical closure of their VVF.

Twenty-eight women had had vaginal VVF repair (78%) and 8 had abdominal repair. Their details including fistula classification are listed in Table 1. All the women completed the following validated questionnaires: Urogenital Distress Inventory-6 (UDI-6) and Incontinence Impact Questionnaire-7 (IIQ-7) to assess urological function, the low anterior resection syndrome (LARS) score to assess bowel function, an EQ5D score to assess overall function, and a health thermometer score to assess general wellness. UDI-6 is a 6-question score measuring urinary symptoms and their severity; a high score indicates poorer quality of life. IIQ-7 is a 7-question score assessing the impact of urinary symptoms on emotional and physical well-being; a high score indicates the significant adverse impact of urinary symptoms. The LARS score is a 5-question score assessing bowel function; a score <20 indicates no bowel dysfunction. The EQ5D3 L (Euro-Quol) assesses five domains of daily living with a score of 5 (11111) indicating no impairment and 15 (33333) indicating maximum impairment. The health thermometer assessment of general well-being is part of the standard EQ5D3 L assessment and rates health at the time of answering the question – with 100 being the best possible health and 0 being the worst.

Sexually active patients were asked to complete the PISQ-12 (pelvic organ prolapse/urinary incontinence

Table 1: Patient and fistula details

	Vaginal VVF closure	Abdominal VVF closure
Age, median (range)	48 (25-88)	48.5 (36-61)
Goh 1	20	6
Goh 2	4	1
Goh 3	2	1
Goh 4	2	0
Total abdominal hysterectomy	9	2
Emergency lower segment cesarean section	2	1
Total laparoscopic hysterectomy	3	2
Anterior resection	2	1
TVT erosion	2	1
Vaginal hysterectomy	1	1
Vaginal cyst excision	2	0
Urethral diverticulum excision	1	0
Ectopic ureter excision	1	0
Cervical cerclage	1	0
Cystoscopy	1	0
Laparoscopic nephroureterectomy	1	0
Laparoscopic trachelectomy	1	0
Bladder-neck reconstruction	1	0

VVF: Vesicovaginal fistulae, TVT: Tension free vaginal tape

questionnaire [POP/UI]) to assess sexual function. PISQ-12 is a condition-specific measure that evaluates sexual function in heterosexual women who suffer from UI and/or POP; a lower score indicates better sexual function (range: 0–48).

All women were also asked to complete these questionnaires retrospectively for their status immediately before their successful VVF closure.

This study was classified as a service evaluation by our institution and did not require Institutional Review Board or equivalent approval.

RESULTS

The fistulae were all iatrogenic in etiology. Twenty-five (69.4%) women were consequent to gynecological surgery, 5 (13.8%) due to urological surgery, 3 (8.3%) followed emergency cesarean section, and 3 (8.3%) followed colorectal surgery. The underlying pathology prompting causative surgical intervention was benign in 25 (69.4%) and malignant in 11 (30.6%) women. The majority of fistulae were Goh Grade 1 (72.2%), which is associated with high rates of closure and postclosure continence in both the resource-limited and resource-rich setting.

Twenty-eight women (78%) had a vaginal repair with Martius fat pad interposition whereas 8 (22%) had abdominal repair with omental interposition. There were two failed anatomical closures, both in women with primary vaginal repairs. These women had successful anatomical closure at the second repair – 1 through the vaginal route and 1 through the abdominal route.

The urinary distress scores, incontinence impact scores, generic quality of life, and general feeling of wellness improved significantly and persistently post-VVF closure. Bowel function was within normal limits both before and following VVF closure. All results are shown in Table 2.

There was no significant difference in urinary distress scores, incontinence impact scores, generic quality of life scores, general feeling of wellness score, bowel and sexual function between women who had had vaginal VVF repair and those who had had abdominal VVF repair [Table 3].

Statistical analysis was by Mann–Whitney U-test.

DISCUSSION

Anatomical closure of VVF was associated with significant sustained improvement and normalization of urinary

Table 2: Urinary, bowel, sexual function, and generic quality of life score pre- and post-vesicovaginal fistulae closure

	Median (range)	
	Pre-VVF closure	Post-VVF closure
UDI-6 score [#]	16.5 (2-24)	4* (0-24)
IIQ-7 score [#]	25.5 (0-28)	2.5* (0-26)
LARS score ^{*,#}	2 (0-40)	0 (0-39)
Sexually active, <i>n</i> (%)	0 (0)	23 (67.6)*
PISQ-12 score ^{*,#}	NA	14 (3-30)
EQ5D3L score [#]	9 (6-13)	6 (5-10)*
EQ5D health thermometer score ^{**}	25 (0-90)	75 (10-100)*

[#]Low score indicates better function, ^{**}High score indicates better function, **P* < 0.01, **Two patients excluded from LARS scoring as had colostomies pre-VVF repair, ***Thirteen patients excluded from PISQ-12 scoring as not sexually active. LARS: Low Anterior Resection Syndrome, VVF: Vesicovaginal fistulae, UDI-6: Urogenital Distress Inventory-6, IIQ-7: Incontinence Impact Questionnaire-7, NA: Not available, PISQ-12: Pelvic organ prolapse/ Urinary incontinence sexual questionnaire

Table 3: Medium- to long-term urinary, bowel, sexual function, and generic quality of life score vaginal versus abdominal vesicovaginal fistulae closure

	Median (range)	
	Vaginal VVF closure	Abdominal VVF closure
UDI-6 score [#]	8 (0-24)	2.5 (0-19)
IIQ-7 score [#]	2.5 (0-26)	2.0 (0-19)
LARS score ^{*,#}	0 (0-37)	0 (0-39)
Sexually active, <i>n</i> (%)	17 (61)	6 (75)
PISQ-12 score ^{*,#}	14 (3-30)	13 (4-24)
EQ5D3L score [#]	6 (5-10)	7 (5-8)
EQ5D health thermometer score ^{**}	80 (30-100)	70 (10-100)

[#]Low score indicates better function, ^{**}High score indicates better function, *Two patients excluded from LARS scoring as had colostomies pre-VVF repair, **Thirteen patients excluded from PISQ-12 scoring as not sexually active. LARS: Low Anterior Resection Syndrome, VVF: Vesicovaginal fistulae, UDI-6: Urogenital Distress Inventory-6, IIQ-7: Incontinence Impact Questionnaire-7, PISQ-12: Pelvic organ prolapse/ urinary incontinence sexual questionnaire

function and distress. General quality of life and perception of wellness were also significantly and durably improved. Good-quality sexual function was restored in two-third of women whereas one-third of women remained sexually inactive. There was no adverse effect on bowel function. There were no differences in outcomes between women having vaginal VVF repair and those having abdominal VVF repair.

There has been much published on the short-term outcomes of successful anatomical closure of VVF and continence post-VVF closure; however, little is known about the long-term functional outcomes of women following successful anatomical closure. As would be expected, urinary function and associated distress significantly and meaningfully improved in the majority (but not all) of the women. There were 5 higher than expected postclosure UDI-6 and IIQ-7 scores, which were consequent to the persistence of preexisting (*n* = 3) and new-onset overactive bladder (OAB) symptoms (*n* = 2). Those women with OAB

symptoms also had lower than expected postclosure health thermometer scores.

In this series, our anatomical closure rates were 96.5% at the first repair within the unit and 100% overall (maximum two repairs). This compares favorably with anatomical closure rates reported in other published series, which range from 58% to 98% depending on whether the fistula is simple or complex and the procedure, which is a primary or secondary (or more) procedure.^[9-11] There are very few series detailing functional outcomes following successful repair.

Flynn *et al.* detailed the gross outcomes in 40 women having VVF repairs at 3-month follow-up, with 85% reporting restoration of sexual activity and 6% voiding dysfunction at this time.^[12] Zappavigna and Herschorn reported on 115 women at a mean follow-up of 14.98 months (range: 1–132). Eleven (6.96%) experienced urge incontinence, 9 (7.83%) stress incontinence, 11 (9.57%) urgency, 12 (10.4%) frequency, and 1 (0.87%) chronic pain.^[13]

Agarwal *et al.* reported 5 women with successful anatomical closure of obstetric VVF at a minimum of 10-year follow-up, who developed obstructive voiding and straining. The urodynamic assessment revealed poor compliance and Valsalva voiding raising the possibility of long-term loss of compliance and hypofunction as a long-term consequence of VVF repair.^[14]

Dolan *et al.* reported urinary outcomes using the Bristol Female LUT Questionnaire in 31 women having successful urogenital fistula repair at a median of 50-month follow-up.^[15] Urgency was reported in 71% of women, nocturia in 68%, stress incontinence in 68%, and urge incontinence in 65% although 87% reported that these symptoms had little or no impact on their quality of life. Fifteen women (68%) in this study described symptoms related to sexual activity; 6 (27%) of them felt this to be a serious issue. Forty-six percent suffered from vaginal dryness, 41% had bothersome urinary symptoms adversely impacting on sexual activity, and 36% reported dyspareunia.^[15]

Lee *et al.* reported a mean UDI-6 score of 4.2 ± 4.6 and a mean IIQ-7 score of 2.5 ± 4.7 in 41 women at a mean of 83 ± 58 months following successful repair of VVF, which is almost identical to the median UDI-6 score of 4 and median IIQ-7 of 2.5 in our series.^[16] The mean age of women in Lee's series was 41 years, younger than the median age in our series (47.5 years); however, only 33% were sexually active in Lee's series compared with

67% in this series. This relative lack of sexual activity is difficult to explain. It is unlikely to be age related as, although the follow-up in Lee's series is longer (mean 83 months c. f. median 40.7 months in our series), the patients are much younger. It may represent cultural differences in levels of sexual activity between American and British women; it may be a chance or it may be related to the predominance of vaginal repair with Martius fat pad interposition in our series (28 [78%]). Nine of 22 (41%) sexually active women in Lee's series reported dyspareunia, of whom none had had Martius fat pad interposition.^[16] In a recent national survey of sexual attitudes and lifestyle within the British population (Natsal), Mercer *et al.* found that 85% of women aged 45–54 years were sexually active within the preceding year while similar reviews of American women indicated similar rates of sexual activity with 75%–80.8% of 40–69 years reporting sexual activity in the preceding year.^[17-19]

Female sexual dysfunction (FSD) is difficult to evaluate. Chedraui *et al.* assessed sexual dysfunction in the Latin–American women aged 40–59 years.^[20] The prevalence of FSD (defined as Female Sexual Function Index score 26.55 or less) was 55.7%. Women reported difficulty across all the domains of female sexual function but mostly dyspareunia and lubrication. It would, therefore, appear that sexual function problems are not uncommon within 40–59-year-old women regardless of whether they have had VVF closure or not.

These outcomes are important from the point of view of patient counseling; ensuring that all preclosure VVF patients are aware that while life significantly improves in all domains for the majority, a few can still be very bothered by irritative lower urinary tract symptoms and one-third will remain sexually inactive.

CONCLUSIONS

Successful anatomical closure of VVF is associated with significant improvement and normalization of urinary function and significant improvement and normalization of the general quality of life and health thermometer score in the majority but not all women. Sexual function is restored in 67% of the women while bowel function is not affected. Route of repair does not affect these long-term functional outcomes.

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Conflicts of interest

There are no conflicts of interest.

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