Transvaginal Repair of Vesico Vaginal Fistula: A 10-Year Experience with Analysis of Factors Affecting Outcomes

Manoj Kumar Samarth Agarwal Apul Goel Ashish Sharma Ajay Agarwal
Siddharth Pandey Satya Narain Sankhwar

Department of Urology, King George's Medical University, Lucknow, India

Keywords

Transvaginal repair · Vesicovaginal fistula · Outcomes

Abstract

Objectives: To highlight the transvaginal route as an excellent approach for repair of a simple trigonal, supra-trigonal vesico-vaginal and urethrovaginal fistulae without compromising on the successful patient outcomes. We also determine factors affecting outcomes in such patients. **Materials and Methods:** A retrospective analysis was carried out on 58 patients with simple trigonal, supra trigonal and urethrovaginal fistula who underwent transvaginal repair in the last 10 years. Simple fistulas were defined as fistula less than 3 cm in size or recurrent fistulae less than 1.5–2 cm in size and located either supra-trigonally (above the bar of mercier) or sub-trigonally (below the bar of mercier) as determined by cystoscopy. **Results:** Obstetric cause, due to ob-

structed labour, was the most common cause of fistula formation (68.96%), while remaining (29.31%) were attributed to hysterectomy. Primary fistulae were found in 68.9% of patients and recurrent fistulae in 31.1% patients. The mean age of patients was 33.4 years. Average fistula size was 1.5 cm. The success rate of primary operation was 84.12% (50/58). On using a multivariate regression model, the underlying aetiology (OR 2.2), fistula location (OR 2.5) and history of previous repair (OR 2.4) were found to be significant factors affecting outcome. **Conclusion:** The transvaginal approach is less invasive and achieves comparable success rates as compared to other methods of vesico-vaginal fistula repair. This surgery with Foley catheter has a high success rate with reduced morbidity. We postulate that vaginal approach should be preferred over abdominal approach for repair of all vaginally accessible vesico vaginal fistulae, both of obstetrical and gynaecological origin.

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Introduction

Vesico vaginal fistula (VVF) is a common occurrence in developed countries with an annual incidence of 50,000–100,000 cases and more than 2 million women affected worldwide [1].

While obstructed or prolonged labour continues to be the leading cause in developing countries, iatrogenic injury during obstetric or gynaecologic surgery such as caesarean section or hysterectomy is the most common cause in the industrialized world [2].

VVF is a debilitating condition that leads to persistent foul odour with urinary discharge leading to excoriation of vulva and vagina. In a developing country like India, where strong religious and cultural beliefs are pertinent in almost every sphere of human life, this causes a lot of social taboos leading to social isolation and physical and emotional distress of the patients.

There is currently no gold standard technique for the management of a simple VVF. Traditionally fistula repair was carried out by either transabdominal or transvaginal approach with success rates ranging from 50 to 100% [3].

Trendelenburg described transabdominal repair, which had become the standard of care for difficult VVFs. Around the mid-19th century, James Sims described his technique of a transvaginal approach with the use of silver sutures and bladder drainage postoperatively. While both transabdominal and transvaginal route have equivalent success rates, the transvaginal approach offers the advantage of avoiding a laparotomy, shorter hospital stay, minimal blood loss and rapid recovery [4–6].

Now newer techniques have also been described including laparoscopic and robotic approaches for repair of VVF, depending on the skill and expertise of the surgeon [7]. However, these procedures involve the use of proper infrastructure, trained manpower and OT personnel, high costs and considerable learning curve, which tantamount to an additional financial burden on the healthcare of a developing country.

Couvelaire in 1953 described the keys to successful repair of VVF as “good visualization, good approximation of margins, good dissection and drainage” [8].

Transvaginal repair of VVFs has now been carried out at our institution in the last 10 years owing to a multitude of advantages. The aim of this study is to highlight transvaginal route as an excellent approach for repair of a simple trigonal, supra-trigonal vesico-vaginal and urethrovaginal fistulae without compromising on the successful patient outcomes. We also determine factors affecting outcomes in such patients.

Materials and Methods

A retrospective analysis was carried out on 58 patients with simple trigonal, supra trigonal and urethrovaginal fistula who underwent transvaginal repair in the last 10 years between 2007 and 2017 at the Department of Urology at King George's Medical University. Approval and Ethical clearance was taken from Institutional Review Board.

Simple fistulas were defined as fistula less than 3 cm in size or recurrent fistula less than 1.5–2 cm in size and located either supra-trigonally (above the bar of mercier) or sub-trigonally (below the bar of mercier) as determined by cystoscopy. Urethrovaginal fistulas were also included. All fistulas at a distance less than 1 cm from ureteric orifice were stented with ureteric catheters. All fistulas involving any of the ureteric orifices requiring reimplantation, bladder neck fistulas, ureterovaginal fistula, vesico-uterine fistula, fistula after radiotherapy/malignancy, diabetes and hypertensive patients were excluded.

All patients were evaluated preoperatively by history, physical examination, serum creatinine, ultrasonography abdomen and intravenous urography. A cystoscopy was performed and the following details were noted – the location, size and numbers of the fistulas, distance from the ureteric orifices, condition of the mucosa around the fistulous opening, thickness of fistulous septum (assessed by inserting a finger trans-vaginally while performing cystoscopy and palpating the fistula). Three swab test with methylene blue was done wherever the diagnosis was uncertain. Vaginal speculum examination was done to assess the vaginal capacity and vaginal mucosal integrity. For all practical purposes, a vagina admitting 3 fingers comfortably was considered adequate. Around 30 patients with urinary tract infection were treated with antibiotics for 2 weeks preoperatively.

The primary repair of fistula was delayed by at least 6 weeks to provide sufficient time for infection and inflammation to subside. The recurrent fistulas were repaired after 3 months. In the pre op period, vaginal douching with betadine was done 48 h before the surgery. In the post op period, a betadine pack was kept and it was removed after 24 h.

Surgical Technique

A preoperative cystoscopy was done, in the lithotomy position, fistula identified and guide wire was placed and secured in the fistulous opening. The patient was then positioned as shown in Figures 1 and 2.

The patient is placed prone in reverse lithotomy position with slight head low tilt. A bolster is placed below the perineum as shown in the figure and this makes working in depth easier. The knee is flexed at 90 degrees and adequately padded with leg stirrups. A Foley catheter is then inserted through the fistulous opening and around 5 mL air injected to fix it in the bladder. We routinely used a 12Fr Foley for fistulous opening less than 1 cm in size and 14Fr Foley for larger fistulas. Once Foley was fixed, a gentle traction is applied; this clearly brings the fistulous orifice in the operating field. Gentle traction on this catheter also helps to expose even the highest vaginal vault fistula and facilitates dissection. The tissues are then infiltrated with 1:200,000 solution of adrenaline to demarcate tissue planes and prevent oozing. The vaginal wall is then dissected all around approximately 5 mm away from the fistulous orifice. Adequate mobilization of vagina from the underlying bladder ensures tension-free closure. The bladder wall is then

Fig. 1. The prone position used for repair of all transvaginal VVF (note the padding and perineal bolster support).

Fig. 2. The final prone positioning in all transvaginal VVF repair (front view).

repaired in 2 layers with vicryl 3–0. The vaginal wall is closed with 2–0 vicryl suture in a continuous fashion.

Of the 2 standard techniques, namely, the Latzko procedure and vaginal flaps techniques, we commonly employ the Martius Flap as a cover over the fistula repair. In patients with recurrent fistula, we use Martius flap cover from the opposite side. Also, if the single labial fat pad did not provide adequate coverage, we use the opposite side flap. Still in certain cases where Martius flap was not available, we used a peritoneal flap.

In all our repairs, we perform a tension-free and water-tight closure with avoidance of overlapping suture lines and without excision of the fistulous tract. This is in contrast to the abdominal approach wherein excision of fistulous tract unnecessarily enlarges the defect and potentiates ureteral injury.

A healthy vascularized Martius flap interposition was done between the bladder and vagina. The bladder was drained with per urethral catheter only in all patients for 2 weeks postoperatively. The same principles also applied to the repair of urethrovaginal fistulae.

Statistical Analysis

Chi-square test was used to analyse the data using graph pad software. Association between 2 variables was found statistically significant if p value was <0.05 .

Results

The results are shown in Table 1 and 58 cases of VVF were managed transvaginally during the study period. Of these, obstetric cause was the most common cause of fistula formation 68.96% (40 out of 58), while 29.31% (17 of 58) were attributed to hysterectomy due to either laparoscopic or open approach. Among the obstetric causes, obstructed labour was the most common cause of fistula for-

Table 1. Results

Variables	Number of patients
Age, years, median (range)	33.4 (19–57)
Location of fistula	
Supratrigonal	15
Subtrigonal	35
Urethrovaginal	8
Size of fistula, cm	
0.5–1	20
1–2	30
2–3	8
Multiplicity	
Single	52
Multiple	6
Type of fistula	
Primary	40
Recurrent	18
Etiology	
Obstetric	
Caesarean	19
Difficult vaginal delivery due to obstructed labour	21
Hysterectomy	
Lap	5
Open	12
Trauma	1
Flap interposition	
Martius	48
Peritoneal	7
Ureteric stents	
Yes	20
No	38

mation. All were simple fistulae. While 31.1% were recurrent fistulae, 68.9% (40 out of 58) were primary fistulae.

The mean age of patients was 33.4 years. Average fistula size was 1.5 cm. All were single fistulae except 6, which were double and all repaired trans vaginally. Ureteric stents were used in 20 patients owing to closeness of fistula to ureteric orifice. Maritus fat pad was interposed in 48 patients and peritoneal flap in 7 patients. Three cases were repaired without any flap interposition.

The mean operative time was 78 ± 18.1 min, and ranged from 60 to 100 min. Mean blood loss was 65 ± 13.4 mL (range 50–90 mL). The mean postoperative hospitalization time was 8 ± 3.8 days (range 7–13 days). No intraoperative complications were observed. The success rate of primary operation was 84.12% (50/58). Transvaginal repair failed in 8 patients.

In a univariate analysis, the underlying aetiology, fistula location, presence of UTI and history of previous repair had a significant impact on surgery outcomes as shown in Table 2. On using a multivariate regression model, the underlying aetiology (OR 2.2), fistula location (OR 2.5) and history of previous repair (OR 2.4) were found to be significant factors affecting outcome.

Discussion

VVFs are an emotionally distressing postoperative complication that has serious social and quality-of-life implications. While Obstetric VVF continues to occur in developing countries due to ignorance and inadequate medical facilities, it is uncommon in the western world. Obstetric causes include injury at the time of caesarean section, forceps delivery and obstructed labour [9, 10]. In our study, almost 70% patients had fistula due to obstetric causes and the remaining had fistula due to hysterectomy.

Various methods of genital fistula repairs have been described. Literature is robust with transabdominal, transvaginal, laparoscopic and robotic approaches of VVF repair and yet none is considered to be the “best” [11–13]. The most important factor is the preference and experience of the surgeon although adjuvant factors like size, location and history of previous surgeries have an impact on the choice of approach [14]. In our series also, we found these factors important in affecting the outcome.

The transvaginal route is now the preferred route of fistula approach at our institution. Plenty of patients now prefer vaginal approach to abdominal laparotomy. Abdominal repair is performed transvesically and there is an

Table 2. Analysis of local variable affecting transvaginal VVF repair

Variables	Successful repair	Failed repair	<i>p</i> value
Etiology			0.023*
Obstetrical	35	5	
Non obstetrical	14	3	
Fistula size, cm			0.231
0.5–1	17	3	
1–2	26	4	
2–3	7	1	
Fistula location			0.0012*
Supratrigonal	10	2	
Subtrigonal	33	4	
Urethrovaginal	7	2	
Urinary tract infection			0.03*
Yes	30	5	
No	28	3	
Previous repair			<0.05*
Yes	15	3	
No	35	5	
Flap interposition			0.48
Yes	48	7	
No	3	1	
Ureteric stents			0.23
Yes	20	4	
No	38	4	

VVF, vesico vaginal fistula.

* Donates *p* value is significant <0.05.

inherent increased morbidity associated with a cystotomy and bowel manipulation. Also, as the bladder is opened, there are increased bladder spasms and discomfort post-operatively. The vaginal approach is a less invasive approach. There is decreased requirement of analgesics, allows high cure rate, shorter hospital stay, relatively lower costs and does not require sophisticated or expensive material, dedicated OTs and infrastructure as needed for laparoscopic or robot-assisted repairs [15]. There is also an obvious advantage of cosmetic difference. We even repaired non-complex supra-trigonal fistulas with a success rate of 80%. Operating such high lying fistula is easily possible transvaginally with our technique described earlier.

Repair of VVF can be a difficult surgical challenge that may require the interposition of various tissue flaps and grafts to buttress the repair. The Martius flap is an excellent flap and can be viewed as the vaginal equivalent of the omentum used in transabdominal repair. Other flaps that can be harvested to buttress the repair of complex

VVF include peritoneal, labial and gluteal muscle flaps [16–18]. We used Martius flap in 48 patients and peritoneal flap in 7 patients. Also, in all our cases of urethrovaginal fistula, we used Martius flap, which could be easily harvested.

Many people argue about the potential problem of fistula exposure during transvaginal repair. We have found that all simple VVF, regardless of location, are amenable to vaginal repair and adjunctive procedures. This was also elaborated by Rajamaheswari et al. [19] who advocated that 3/4th gynaecological supra-trigonal VVF can be repaired vaginally in first attempt with a success rate comparable to that of the abdominal approach.

The advantages of our technique are innumerable. While exposing the bladder and perivesical fascia and creating vaginal wall flaps, high-lying fistulae can be easily approached by inserting a catheter into the fistulous tract and applying gentle downward traction. This approach also improves visualization of the structured layers of the fistula orifice, which is beneficial for the excision of scar tissue surrounding the fistula orifice. Suturing can also be performed with no tension and good hemostasis. It is acceptable to repeat the repair through a vaginal approach even after a first vaginal or transabdominal failure or vice versa.

Conclusion

The transvaginal approach is less invasive and achieves comparable success rates as compared to other methods of VVF repair. Genital fistula repair surgery with Foley catheter has a high success rate, reduced morbidity, minimal blood loss and short hospital stay. We postulate that vaginal approach should be preferred over abdominal approach for repair of all vaginally accessible VVF, both of obstetrical and gynaecological origin.

Disclosure Statement

The authors declare that they have no conflicts of interest to disclose.

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Informed Consent

Informed consent was received from the patient.

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