

## SURGICAL MANAGEMENT OF VESICOVAGINAL FISTULA (VVF): EXPERIENCE FROM A TERTIARY CARE CENTRE

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**Abstract**

**Background:** Vesicovaginal fistula (VVF) is a severe complication of pelvic surgery with significant medical, psychological, and social consequences. This study aimed to evaluate the aetiological factors, surgical interventions, clinical outcomes, and variables influencing the success rates of VVF. **Materials and Methods:** This retrospective analysis included 32 female patients diagnosed with vesicovaginal fistula (VVF) who underwent surgical intervention at the Department of Urology, SRM Medical College and Hospital between 2017 and 2022. Comprehensive data were collected on patient demographics, aetiology, duration before presentation, prior treatments, clinical findings, surgical approaches, and postoperative outcomes. The choice of surgical technique was determined based on individual patient factors, fistula location, and complexity of the fistula. **Results:** Most VVFs were supratriangular (90.6%) and classified as simple (65.6%). Primary fistulas were predominant (93.7%). The transabdominal (modified O'Connor) procedure achieved an 88.4% success rate, whereas the transvesical approach had a 100% closure rate. The vaginal approach had a success rate of 66.6%. Supratriangular and triangular fistulas had 100% and 66.6% closure rates, respectively. Simple fistulas had a 100% success rate, whereas complex fistulas had a 90.9% success rate. The success rates for primary and recurrent fistulas were 96.6% and 50%, respectively. Postoperative complications included failure or recurrence (12.5%), urgency (15.6%), urge incontinence (6.3%), surgical site infection (3.1%), and dyspareunia (3.1%), which were conservatively managed. **Conclusion:** We concluded that iatrogenic causes, mainly hysterectomy, are the leading VVF aetiology. Primary fistulas have higher closure rates. The use of interposition flaps improved the outcomes. Early diagnosis, individualised surgery, and multidisciplinary care are crucial for improving success rates and quality of life.

## INTRODUCTION

A vesicovaginal fistula (VVF) is an abnormal opening between the bladder and vaginal wall. VVF is one of the most severe complications of pelvic surgery, resulting in significant medical, psychological, and social consequences.<sup>[1]</sup> Although historically associated with obstetric complications, VVF is now more frequently observed in gynaecological and urological surgeries. Hysterectomy constitutes a substantial proportion of these cases.<sup>[2]</sup> The prevalence of VVF is estimated to be 2 million cases in Sub-Saharan Africa and South Asia, with an annual incidence of 50,000-100,000 new cases.<sup>[3]</sup> In developing countries, VVF is predominantly attributed to obstructed labour, whereas in developed nations, iatrogenic causes such as hysterectomy are more prevalent.<sup>[4]</sup> Additional

aetiological factors include urological interventions, physical trauma, sepsis, radiotherapy, and malignancy.<sup>[5]</sup> Less common aetiologies include pelvic inflammation, foreign bodies, and erosion resulting from pessaries or vigorous coitus.<sup>[5]</sup> Lower urinary tract fistulae and anomalies may manifest with diverse symptomatology, including persistent urinary leakage, periumbilical drainage, pain, and irritative micturition.<sup>[6]</sup> Diagnostic approaches include clinical examination, ultrasonography, computed tomography, voiding cystourethrogram, and magnetic resonance imaging.<sup>[6]</sup> Ultrasound is frequently employed as the initial diagnostic modality, indicating high diagnostic accuracy for urachal anomalies.<sup>[6]</sup> VVF significantly impacts the quality of life, affecting physical, mental, social, and sexual domains.<sup>[4]</sup> Prevention, early diagnosis, and appropriate treatment are crucial, with

combined conservative and surgical approaches achieving success rates exceeding 90%.<sup>[4]</sup>

The vesicovaginal fistulae significantly affect women's quality of life, with diverse therapeutic interventions available.<sup>[7]</sup> Conservative management comprises pessaries, while surgical approaches encompass transvaginal, transabdominal, and laparoscopic/robotic techniques.<sup>[8]</sup> Transvaginal and laparoscopic/robotic approaches demonstrate lower rates of prolonged hospitalisation, major complications, and readmission compared to transabdominal procedures.<sup>8</sup> Native tissue repair is considered a safe and efficacious approach for pelvic organ prolapse, although mesh augmentation may offer enhanced durability and potential complications.<sup>[7]</sup> Surgical decision-making should consider factors such as anatomical defects, symptom severity, patient activity level, and repair durability.<sup>[7]</sup> Despite advancements in surgical techniques for VVF repair, there is no consensus on the optimal approach, particularly for recurrent and complex fistulas. The comparative effectiveness of transvaginal, transabdominal, and minimally invasive techniques, including laparoscopy, requires further investigation.

#### Aim

This study aimed to evaluate the aetiological factors, surgical interventions, clinical outcomes, and variables influencing the success rates of vesicovaginal fistula.

## MATERIALS AND METHODS

This retrospective analysis included 32 female patients with VVF in the Department of Urology at SRM Medical College and Hospital who underwent surgical intervention between 2017 and 2022. The study was initiated after approval from the Institutional Ethics Committee.

#### Inclusion Criteria

Patients with VVF who underwent surgery were included.

#### Exclusion Criteria

Cases with insufficient details and cases with ureteric involvement were excluded.

#### Methods

Data were collected from the hospital information system (HIS) and included patient demographics, aetiology, time to presentation, prior treatments,

clinical findings, management approaches and outcomes. The surgical approach was selected based on the patient factors and fistula characteristics. The preoperative evaluation comprised a comprehensive vaginal examination, cystoscopy, and excretory urography to assess the location, size, and complexity of the vesicovaginal fistula. Surgical management was tailored based on the fistula location. Supratrigonal fistulas were primarily managed using transabdominal approaches, including the modified O'Connor repair, whereas trigonal fistulas were addressed through transvaginal repair.

In complex cases, additional ureteric reimplantation was performed as necessary. Interposition flaps reinforced the repair and promoted healing—omentum flaps for transabdominal and transvesical repairs and Martius flaps for transvaginal repairs. Postoperatively, patients were managed with indwelling urethral catheters and suprapubic cystostomy tubes for bladder drainage. Anticholinergics and laxatives were administered to prevent bladder spasms and constipation, respectively, and prophylactic antibiotics were administered according to the protocol. A retrograde cystogram was performed three weeks postoperatively to confirm fistula closure. Patients were advised to avoid tampons and abstain from sexual activity for 12 weeks to facilitate optimal recovery. Data are presented as frequencies and percentages.

## RESULTS

A total of 32 patients were included in the study, with a mean age of 47.5 years (range: 32–58 years). The primary causes of fistula formation were transabdominal hysterectomy in 81.25% of cases, followed by vaginal hysterectomy (6.25%), lower segment cesarean section (LSCS) (3.12%), obstructed labor (3.12%), and carcinoma cervix (3.12%).

The majority of vesicovaginal fistulas were supratrigonal in location in 90.6% of patients, while trigonal fistulas were observed in 9.3% of patients. Regarding the nature of the fistulas, 65.6% were classified as simple and 34.3% as complex. Additionally, primary fistulas were predominant in 93.7% of patients, while recurrent fistulas were less common in 6.2% of patients. [Table 1]

**Table 1: Surgical characteristics of vesicovaginal fistulas**

		N (%)
Site	Supratrigonal	29(90.6%)
	Trigonal	03(9.3%)
Nature	Simple	21(65.6%)
	Complex	11(34.3%)
Type	Primary	30(93.7%)
	Recurrent	02(6.2%)

Among the 26 patients who underwent the transabdominal (modified O'Connor) procedure, complete closure was achieved in 88.4% of patients,

while 11.5% experienced treatment failure. The transvesical approach was performed with a 100% success rate in all three cases. The vaginal approach

achieved complete closure in 66.6% of the patients, whereas 33.3% failed. [Table 2]

**Table 2: Therapeutic outcomes of surgical management**

		Therapeutic results N (%)	
		Complete closure	Failed
Transabdominal (modified O'Connor)	26	23(88.4%)	3(11.5%)
Transvesical	3	3(100%)	0
Vaginal	3	2(66.6%)	1(33.3%)

Supratrigonal fistulas had a 29 (100%) closure rate, while trigonal fistulas showed a success rate of 2 (66.6%), with 1 (33.3%) failing to close. Simple fistulas showed a 21 (100%) success rate, whereas complex fistulas had a success rate of 10 (90.9%), with failure occurring in one (9%) patient. Regarding

fistula type, primary fistulas had a success rate of 29 (96.6%), with only 1 (3.33%) failing to close. Recurrent fistulas had a success rate of 1 (50%), with 1 (50%) failing to achieve complete closure. [Table 3]

**Table 3: Therapeutic outcomes based on fistula characteristics**

			Therapeutic results N (%)	
			Successful	Failed
Site	Supratrigonal	29	29(100%)	0
	Trigonal	3	2(66.6%)	1(33.3%)
Nature	Simple	21	21(100%)	0
	Complex	11	10(90.9%)	1(9.0%)
Type	Primary	30	29(96.6%)	1(3.33%)
	Recurrent	2	1(50%)	1(50%)

Among the complications observed following surgical repair, failure or recurrence was noted in four patients, of whom three were successfully managed and one was lost to follow-up. Urgency was reported in five patients and was managed conservatively in

all cases. Similarly, urge incontinence was observed in two patients, surgical site infection (SSI) in one patient, and dyspareunia in one patient, all of which were managed conservatively. [Table 4]

**Table 4: Table 4: Postoperative complications and their management**

Complications	N (%)	Management
Failure/Recurrence	4	Three Mx successfully, 1 lost to F/U
Urgency	5	Mx conservatively
Urge incontinence	2	Mx conservatively
SSI	1	Mx conservatively
Dyspareunia	1	Mx conservatively

## DISCUSSION

In our study, the mean age of the patients was 32.9 years. The primary cause of VVF is iatrogenic, with transabdominal hysterectomy being the most common contributing factor. Other causes included vaginal hysterectomy, lower segment caesarean section (LSCS), obstructed labour, and cervical carcinoma. The retrospective studies by Umashankar and Shivakumar reported the primary causes of vesicovaginal fistula were predominantly iatrogenic, with transabdominal hysterectomy being the most common contributing factor.<sup>[9]</sup>

Kumar et al. reported that obstetric causes, such as obstructed labour, were the most common cause of fistula formation (68.96%), while the remaining (29.31%) were attributed to hysterectomy. Primary fistulae were found in 68.9% of the patients and recurrent fistulae in 31.1% of the patients. The mean age of patients was 33.4 years.<sup>[10]</sup> The study by Jadav et al. reported a mean age of 40.8 years (range 20-70 years). The fistula size varied from 0.5 to 5 cm. The location of the fistula was supratrigonal in 20 (84%)

and trigonal in 4 (16%) cases. Fistula was simple in 16 patients (68%) and complex in 8 patients (32%). 21 patients were treated by open surgical method and laparoscopic technique in 3 patients.<sup>[11]</sup>

In our study, most VVFs were supratrigonal, with only a small percentage being trigonal. Most patients were classified as having simple fistulas, whereas a smaller proportion were classified as having complex fistulas. Primary fistulas were more frequently encountered than recurrent fistulas. Regarding surgical outcomes, the transabdominal (modified O'Connor) procedure was the most commonly performed, achieving a high success rate, although a small number of patients experienced failure. The transvesical approach demonstrated a 100% closure rate, whereas the vaginal approach had a lower success rate, with some patients failing to close the defect. Supratrigonal fistulas had a complete closure rate, whereas trigonal fistulas showed a comparatively lower success rate. Simple fistulas had a higher success rate than complex fistulas, and primary fistulas exhibited a higher closure rate than recurrent ones.

Kumar et al. reported that the transvaginal approach for vesicovaginal fistula repair achieves high success rates, with aetiology, fistula location, and history of previous repair as significant factors affecting outcomes. The study shows the success rate of the primary operation was 84.12% (50/58). Using a multivariate regression model, the underlying aetiology (odds ratio [OR] 2.2), fistula location (OR 2.5), and history of previous repair (OR 2.4) were found to be significant factors affecting the outcome.<sup>[10]</sup> A study by Jadav et al. reported a success rate of 100% (3 patients) in patients who underwent laparoscopic repair and 17/21 (80.95%) in patients treated by the open surgical method. Failures could be attributable to extensive fibrosis, especially in prior failed repairs and in those with prolonged duration of symptoms.<sup>[11]</sup> Studies by Sharma et al. and Akman et al. also reported high success rates for laparoscopic and transvesical repairs.<sup>[12,13]</sup>

A study by Milicevic et al. reported the transabdominal (modified O'Connor) procedure had the highest success rate for vesicovaginal fistula repair, though some patients failed, while the transvesical approach had 100% closure and the vaginal approach had lower success.<sup>[14]</sup> A study by Kapoor et al. reported the transabdominal and transvaginal approaches for vesicovaginal fistula repair both achieved high success rates, with the transvaginal approach having shorter recovery times.<sup>[15]</sup>

In our study, postoperative complications were observed in a few patients, with failure or recurrence occurring in a small number of patients, most of whom were successfully managed. Other complications included urinary urgency, urge incontinence, SSI, and dyspareunia, which were managed conservatively. A study by Debodinance et al. reported postoperative complications as bladder injuries are found in 3.5% (0 to 6%), haemorrhage in 1% (0 to 3.8%), urinary infection in 4.5% (0 to 11.3%), momentary urine retention in 17% (1.6 to 64.5%), de novo dysuria in 10.9% (0 to 35.5%), de novo urges in 6.9% (0 to 11%).<sup>[16]</sup>

## CONCLUSION

Our study concluded that iatrogenic causes, particularly hysterectomy, are the primary aetiology of VVF. Primary fistulas demonstrated a significantly higher closure rate than recurrent fistulas, underscoring the challenges associated with repeat repairs. The use of interposition flaps improved surgical outcomes and reduced recurrence rates. Postoperative complications, including urgency, urge

incontinence, and SSI, were observed but managed conservatively. These findings reinforce the importance of early diagnosis, meticulous preoperative evaluation, and individualised surgical planning to optimise outcomes. Future research should focus on refining minimally invasive techniques and exploring novel adjunctive therapies to enhance the success rates of VVF repair. Multidisciplinary collaboration remains essential for comprehensive patient care and long-term improvements in quality of life.

## REFERENCES

- Gerber GS, Schoenberg HW. Female urinary tract fistulas. *J Urol* 1993; 149:229–36. [https://doi.org/10.1016/s0022-5347\(17\)36045-7](https://doi.org/10.1016/s0022-5347(17)36045-7).
- Goodwin WE, Scardino PT. Vesicovaginal and ureterovaginal fistulas: a summary of 25 years of experience. *J Urol* 1980; 123:370–4. [https://doi.org/10.1016/s0022-5347\(17\)55941-8](https://doi.org/10.1016/s0022-5347(17)55941-8).
- Chinthakanan O, Sirisreetreerux P, Saraluck A. Vesicovaginal fistulas: Prevalence, impact, and management challenges. *Medicina (Kaunas)* 2023; 59:1947. <https://doi.org/10.3390/medicina5911947>.
- Khalid N, Qureshi FM. Vesicovaginal Fistula: Psychosocial problems of VVF in rural areas of Pakistan. *J Bahria Uni Med Dent Coll* 2018; 08:65–6. <https://doi.org/10.51985/jbumdc2018043>.
- Romics I, Kelemen Z, Fazakas Z. The diagnosis and management of vesicovaginal fistulae: Vesicovaginal fistula. *BJU Int* 2002; 89:764–6. <https://doi.org/10.1046/j.1464-410x.2002.02713.x>.
- Yiee JH, Garcia N, Baker LA, Barber R, Snodgrass WT, Wilcox DT. A diagnostic algorithm for urachal anomalies. *J Pediatr Urol* 2007; 3:500–4. <https://doi.org/10.1016/j.jpuro.2007.07.010>.
- Siddiqui NY, Edenfield AL. Clinical challenges in the management of vaginal prolapse. *Int J Womens Health* 2014; 6:83–94. <https://doi.org/10.2147/IJWH.S54845>.
- Jefferson FA, Hanson KT, Robinson MO, Habermann EB, Madsen AM, Gebhart JB, et al. Perioperative outcomes of vesicovaginal fistula repair by surgical approach. *Urogynecology (Hagerstown)* 2024; 30:114–22. <https://doi.org/10.1097/SPV.0000000000001394>.
- Umashankar K, Shivakumar H. Analysis of vesicovaginal fistulas in tertiary care hospital: A retrospective study of 12 years. *New Frontiers in Medicine and Medical Research*; 2021, p. 65–9. <https://doi.org/10.9734/bpi/nfmmr/v9/3650F>
- Kumar M, Agarwal S, Goel A, Sharma A, Agarwal A, Pandey S, et al. Transvaginal repair of vesico vaginal fistula: A 10-year experience with analysis of factors affecting outcomes. *Urol Int* 2019; 103:218–22. <https://doi.org/10.1159/000499411>.
- Jadav RR, Manjuprasad G. An outcome of the management of vesicovaginal fistula: experience at KIMS, Hubli, Karnataka, India. *Int Surg J* 2019; 6:552. <https://doi.org/10.18203/2349-2902.isj20190402>.
- Sharma S, Rizvi SJ, Bethur SS, Bansal J, Qadri SJF, Modi P. Laparoscopic repair of urogenital fistulae: A single centre experience. *J Minim Access Surg* 2014; 10:180–4. <https://doi.org/10.4103/0972-9941.141508>.
- Akman RY, Sargin S, Özdemiş G, Yazicioğlu A, Çetin S. Vesicovaginal and Ureterovaginal Fistulas: A Review of 39 Cases. *Int Urol Nephrol* 1999; 31:321–6. <https://doi.org/10.1023/a:1007169902044>.
- Milicevic S, Krivokuca V, Ecim-Zlojutro V, Jakovljevic B. Treatment of vesicovaginal fistulas: an experience of 30 cases. *Med Arch* 2013; 67:266–9. <https://doi.org/10.5455/medarh.2013.67.266-269>.
- Kapoor R, Ansari MS, Singh P, Gupta P, Khurana N, Mandhani A, et al. Management of vesicovaginal fistula: An experience of 52 cases with a rationalized algorithm for choosing the transvaginal or transabdominal approach. *Indian J Urol* 2007; 23:372–6. <https://doi.org/10.4103/0970-1591.36709>.
- Debodinance P, Delporte P, Engrand JB, Boulogne M. Complications of urinary incontinence surgery: 800 procedures. *J Gynecol Obstet Biol Reprod (Paris)* 2002; 31:649–62. <https://www.ncbi.nlm.nih.gov/pubmed/12457137>.