

OUTCOME OF EARLY TRANSABDOMINAL SUPRAPUBIC REPAIR OF VESICOVAGINAL FISTULA SECONDARY TO BENIGN GYNECOLOGICAL AND OBSTETRIC SURGERIES

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ABSTRACT

Objectives: To determine the effectiveness of early operative management of patients with Vesicovaginal fistula (VVF) secondary to benign gynecological surgeries.

Material and methods: It is a descriptive case series of 70 patients selected from August 2018 to Oct 2022. All patients meeting inclusion criteria had routine lab investigations, imaging, cystoscopy, and vaginoscopy. The suprapubic approach described by O'Connor et al; was used. All surgeries were performed between the 4th and 6th weeks after the onset of the fistula to allow some time for tissue healing. All patients were followed after 2 weeks; a cystogram was performed to document fistula closure followed by removal of Foleys catheter. A second follow-up was at 3 months, patients were assessed with patient global impression of improvement score (PGI-I) for improvement in symptoms.

Results: The mean age of the patients was 40.6 ± 10.2 years. 14(19.7%) patients were primipara while 56 (78.9%) patients were multipara. The mean fistula size was 11.5 ± 4.5 mm. Supra-trigonal fistulas were more common than trigonal fistulas 43(60.6%) vs 27(38%). Hysterectomy (including cesarean hysterectomy and simple hysterectomy) was the commonest cause of VVF followed by cesarean section and difficult labor 33(46.5% vs 21(29.6) vs 12(16.9%). The overall mean operative time was 125.3 ± 10.7 minutes. The mean hospital stay was 3.8 ± 0.8 days. The fistula was successfully closed in 64 (90.1%) patients while 6 (9.9%) patients had failed surgery. The small-size fistulas (5-10mm) had a higher success rate of closure than larger fistulas (11-20mm) with statistical significance ($p=0.02$). Over 63 (90 %) patients responded PGI score below 3 with much improvement in symptoms.

Conclusion: Our results show that early operative management of VVF secondary to benign gynecological and obstetric surgeries is feasible and effective. It also improves the symptoms of patients with PGI-I score.

KEYWORDS: Vesicovaginal fistula (VVF), early repair, hysterectomy.

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INTRODUCTION

Vesicovaginal fistula (VVF) is an abnormal epithelialised tract between the bladder and the vagina. This leads to continuous involuntary leakage of urine into the vagina. The continuous wet feeling, odor, and discomfort not only affect physical and mental well-being but also impact the social and sexual aspects of patients¹. In the West, the most common causes of VVF are gynecological or pelvic surgeries, radiotherapy, and malignancy. In regions with underdeveloped health infrastructure, the most common cause is obstructed

labor. The impacted fetal head causes ischemic injury of tissues in obstructed and prolonged labor leading to VVF². The incidence varies between 0.3% and 2.0% in developed countries³.

Hysterectomy, in its various forms, is the leading cause of VVF with an incidence between 63% and 91%⁴. Frequent use of electrocoagulation causes inadvertent injuries to the urinary tract, the tissue necrosis and fistula formation take time. Thus 70% of fistulas are diagnosed post-operatively⁵. The incidence is much higher in developing countries. In South Asia and Africa, incidence estimates up to 4.09 cases per 1000 deliveries⁶. The important factors are early age marriage, poverty, lack of education, malnourishment, and poor infrastructure for emergency obstetric care⁷. Multiple surgical approaches like open transabdominal, transvaginal, laparoscopic, robotic, and transurethral endoscopic with or without tissue interposition have been described. There is no standardized timing for successful surgical repair⁸. There is a paucity of literature on successful early surgical repair of VVF in our setup. Most of the literature supports 3 months for

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repair after fistula development. This time is too long which leads to social and psychological problems for the patients. There is a possibility that early repair of VVF will not only improve the morbidity of the patients but also address their psychological and social well-being. We aimed to determine the effectiveness of early operative management of patients with VVF secondary to benign gynecological surgeries. The Patient Global Impression of Improvement (PGI-I) is a validated instrument for both urinary incontinence and prolapse surgeries. It is used to quantify improvement in symptoms after intervention⁹. We used PGI-I to assess a patient's perception of changes after VVF repair at 3 months.

MATERIAL AND METHODS

It is a descriptive case series carried out from August 2018 to October 2022 in the urology department of Khyber Teaching Hospital. The study included 70 patients meeting the inclusion criteria. All patients developing VVF after benign gynecological surgery with ages between 20 years to 60 years were included. The exclusion criteria included patients having malignancy, patients having a history of fistula secondary to radiation, patients with a history of diabetes (Fasting blood glucose of $>126\text{mg/dl}$), patients with other immunosuppressive states like HIV, genitourinary tuberculosis, and other abnormalities like ureterovaginal fistula and rectovesical fistula, patients with recurrent benign VVF.

The study was approved by the ethical and research committee of the hospital. Patients were selected through OPD using inclusion criteria. The patients were briefed about the purpose of the study. An informed consent was taken in writing. All patients went through history, and clinical examination followed by necessary preoperative investigations. Cystoscopy and vaginoscopy were performed. The characteristics of the fistula (number, location, size, and proximity to ureteral orifices) were recorded. Concomitant ureterovaginal fistula was excluded by computed tomography urography (CTU). The surgery was done by a consultant urologist having more than 5 years of experience. The suprapubic approach described by O'Connor et al;¹⁰ was used. All surgeries were performed between the 4th and 6th weeks after the onset of the fistula to allow some time for tissue healing. After VVF surgery all patients were kept under observation in the ward for 3 days and were sent home on 4th postoperative day. The successful repair was confirmed by a cystogram on the 14th postoperative day as a routine. The catheter was then removed to see any leak and assess the leak. Double j stents were removed after one month of surgery with the flexible cystoscope.

The patients who had successful closure of the fistula were followed after three months and were assessed with a PGI-I score. At three months postoperative wound healing occurs and irritative lower urinary tract symptoms settle in most of the patients. Secondly, it is reasonable for patients to note the change in symptoms and compare the severity of symptoms before and after the repair. Success was defined as "anatomically closed/healed fistula or functional absence of continuous urinary leakage and

resolution of symptoms". A proforma was used to collect all data. The SPSS version 20 was used for analysis. Mean and Standard deviation were used for quantitative variables i.e., age, fistula size, operative time, and hospital stay. Percentage and frequencies were computed for categorical variables like parity, location of fistula, etiology of fistula, and success rate. The chi-square test and Student t-test were used to compare categorical and quantitative variables respectively. A p-value ≤ 0.05 was taken as significant.

RESULTS

The basic demographics, features of the fistula, and intraoperative details are shown in Table 1. The mean age of the patients was 40.6 ± 10.2 years. The majority of patients 56 (78.9%) were multipara. The mean fistula size was $11.5 \pm 4.5\text{mm}$. Supratrigonal fistulas 43(60.6%) were more common. Hysterectomy (including cesarean hysterectomy and simple hysterectomy) was the commonest cause of VVF followed by cesarean section and difficult labor 33(46.5% vs 21(29.6) vs 12(16.9%). Nearly half of the patients 31(43.7%) had double j stents placed due to the proximity of the fistula to ureteric orifices. The rest of the patients had ureteric catheterization to identify ureters during surgery. The overall mean operative time was 125.3 ± 10.7 minutes and the mean hospital stay was 3.8 ± 0.8 days. The fistula was successfully closed in 64 (90.1%) patients while 6 (9.9%) patients had failed surgery. The reasons for failure were large fistula size, urinary tract infection, and Foley catheter blockage after patients were discharged home.

10(14.2%) patients had minor complications which included wound infection in 2 patients, 5 patients with urinary tract infections required a change of antibiotics and 3 patients had hematuria requiring bladder irrigation with normal saline for 6-8 hrs. Table 2 shows the PGI-I score in patients with successful repair after 3 months. The average PGI-I score was 2 (much better). Over 63 (90 %) patients responded PGI score below 3. 2 (2.8%) patients had a PGI score of 3 while the remaining 5 (7%) reported no change in symptoms. All these 5 patients had urinary urgency and urge incontinence and were continued on oral anticholinergic medications.

DISCUSSION

Vesicovaginal fistula has a variety of negative implications on physical, social, and sexual life¹. Obstetric causes include injury to the bladder during obstructed labor, forceps delivery, and cesarean section. This is the most common cause in developing countries due to ignorance and inadequate access to health care. Surgical repair is the primary method of treating VVFs with successful outcomes $\geq 90\%$. Various surgical approaches have been adopted for VVF repair (vaginal, transabdominal, laparoscopic, and robotic) but the debate about the best approach is still open¹¹. A suprapubic approach is indicated when a transvaginal repair is not feasible (higher fistula, vaginal stenosis, concomitant bladder augmentation, or

Table 1: Basic demographic features and intraoperative and post-operative details

Parameter		Value	%95 CI
Mean Age (years $\pm$ SD)		40.6 $\pm$ 10.2	38.1 – 43.0
Parity	Primigravida	14 (19.7)	
	Multigravida	56 (78.9)	
Mean Fistula Size (mm $\pm$ SD)		11.5 $\pm$ 4.5	9.4 – 11.6
Fistula Location	Supratrigonal	43 (60.6)	
	Trigonal	27 (38)	
Etiology of fistula	Cesarean Section	20 (28.6)	
	Difficult labor	13 (18.6)	
	Hysterectomy	33 (47)	
	Trauma	4 (5.7)	
Success rate		64 (90.1)	
Double j stents		31 (43.7)	
Mean operative time		125.31 $\pm$ 10.7	122.7 – 127.9
Mean Hospital Stay (days)		3.8 $\pm$ 0.8	3.6 – 4.0
Postoperative complications	Wound infection	2	
	Urinary tract infections	5	
	Hematuria	3	

Table 2: Patient Global Impression of improvement score at 3 months

PGI score	Interpretation	N (%)
1	Very much better	35 (50)
2	Much better	28 (40)
3	A little better	2 (2.8)
4	No change	5 (7)
5	A little worse	-
6	Much worse	-
7	Very much worse	-

proximity to the ureter). The typical recommended repair is carried out after at least 3 months to allow the inflammation to settle. Early VVF repair can be performed when some contraindications like radiotherapy-induced VVF, active infection, and concomitant enteric injury are excluded. Early VVF repair has the advantage of avoiding prolonged urine leakage thus improving the patient's quality of life¹². Some reports indicate that the timing of repair does not affect the outcome when principles, such as adequate exposure, identification of structures, wide mobilization, tension-free closure, good hemostasis, and uninterrupted bladder drainage are followed¹³. A change has been observed in the etiology of female urogenital fistula in Pakistan. A study carried out at Bahawal Victoria Hospital Bahawalpur quoted that post-hysterectomy fistula is more

common than obstetric fistula (61% vs. 38.46%)¹⁴. Another study at the same center showed a 55% rate of post-hysterectomy fistulas in contrast to 40 % post-obstructed labor fistulas¹⁵. However, our study showed that 53% of fistulas were due to obstetric causes and 47% were due to non-obstetric (post hysterectomy) causes. Literature shows that successful VVF repair rate ranges between 75 to 95%¹¹.

In our study, successful closure of the fistula was observed in 64 (90.1%) patients while 6 (9.9%) patients had failed surgery. The reason for failure was large fistula size; urinary tract infection and Foley's catheter blockage after patients were discharged home. All of our patients had primary VVF (fresh fistula less than 3 cm in size located either supra-trigonally or at trigone ridge as determined by cystoscopy). However, it is challenging to directly compare our outcomes with other studies due to potentially differing demographics, definitions of successful closure, and follow-up duration. The complications in our study were minor including wound infection, urinary tract infection, and hematuria that were successfully treated. Wound infection occurred in two patients who were obese. Five patients had urinary tract infections after they were discharged home and were readmitted for intravenous antibiotics. Hematuria in three of the patients was self-limiting and required bladder irrigation only in the postoperative period. We used the PGI score to assess a patient's perception of changes in symptoms after VVF repair at 3 months. 90% of patients with successful VVF repair responded with a PGI score below 3 (much better). Only 3 patients had no improvement in symptoms due to urinary urgency and urge incontinence and were continued on oral anticholinergic medications. Some patients may experience new onset overactive bladder symptoms even after successful repair of VVF which impacts their quality of life. To our knowledge, this is the first study to use the PGI score for patient improvement of symptoms after VVF surgery as it has been validated for urine incontinence and pelvic organ prolapse. A low PGI score shows the satisfaction of patients and improvement in symptoms after surgery.

There are certain limitations in our study. It is difficult to determine the role of evolving surgical techniques in successful repair in a period of 4 years. Secondly, the follow-up duration is limited to 3 months, and longer follow-ups after resuming sexual activity are missing. Thirdly it is a single-center study and data on the educational level of patients, awareness about emergency obstetric care, and accessibility to healthcare are lacking. Despite limitations, the study shows that early repair in simple VVF secondary to benign gynecological and obstetric causes has a higher success rate with improvement in symptoms and quality of life. More prospective, multicenter randomized studies are needed to determine gold standards for the surgical approach, timing of surgery, standardized reporting about follow-up, and quality of life in patients with VVF repair.

CONCLUSION

Our study results show that early operative management of VVF secondary to benign gynecological and obstetric surgeries is feasible and effective. It potentiates the social and physical well-being of patients on patient global impression of improvement score.

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Authors Contribution:

Following authors have made substantial contributions to the manuscript as under

Authors	Conceived & designed the analysis	Collected the data	Contributed data or analysis tools	Performed the analysis	Wrote the paper	Other contribution
Ullah H	✓	✗	✓	✗	✓	✗
Khan N	✓	✓	✗	✓	✓	✗
Ghyur MS	✓	✓	✗	✓	✓	✗
Rafi A	✓	✗	✗	✓	✗	✗
Rehman IU	✗	✗	✓	✓	✗	✓

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Ethical Approval:

This Manuscript was approved by the Ethical Review Board of Khyber Medical College, Peshawar Vide No. 727/DME/KMC.

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