

Outcome of Open Transvesical Repair of Vesicovaginal Fistulae in Comparison to Transperitoneal Extravasical Repair

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Abstract:

Background: Vesicovaginal fistulae (VVF) are the most common acquired fistula of the urinary tract and have been known since ancient times. The etiology of VVF differs in various parts of the world. In the industrialized world, the most common cause (>75%) of VVF is injury to the bladder at the time of gynecologic, urologic, or other pelvic surgery. In our country VVF most commonly occur as a result of prolonged obstructed labor due to cephalopelvic disproportion, with resulting pressure necrosis to the anterior vaginal wall, bladder, bladder neck, and proximal urethra from the baby and as a post-surgical (Total abdominal hysterectomy, vaginal hysterectomy, lower uterine cesarean section). The goal of treatment of VVF is the rapid cessation of urinary leakage with return of normal and complete urinary and genital function. Open trans vesical repair of vesico vaginal fistula is a safe and efficient method vesicovaginal fistula repair. **Objectives:** The primary purpose of this study is to find the outcome of open transvesical repair of vesicovaginal fistulae in comparison to transperitoneal extravasical repair. **Methods and Materials:** This prospective type of observational study performed in the Department of Dhaka Medical College Hospital, Dhaka during the period from January 2018 to December 2018. This study was carried on patients who were diagnosed as Vesicovaginal Fistula on clinical examination and cystoscopic examination. Data collected in a pre-designed questionnaire by face to face interview. Data analyses completed by the help of SPSS version 16. **Results:** Total 32 consecutive patients selected purposefully. Every patient evaluated by clinical examination, appropriate investigations and after 12 weeks of the onset of VVF, then half of the patient were unergone transvasical and half of the patient undergone extravasical repair. Then the immediate and late post-operative outcome evaluated. The patient informed about the nature of the study. A written consent taken from the patient. **Conclusion:** Open transperitoneal repair of vesico vaginal fistula is a safe and efficient method of supratrigonal vesico vaginal fistula repair. So the outcome of open transvesical repair of vesicovaginal fistulae is not better than transperitoneal repair rather transperitoneal repair is to some extent.

Key Words: Vesicovaginal Fistulae (VVF); Transvesical repair, Extravasical repair, Comparative study.

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I. Introduction

Vesicovaginal fistulae (VVF) is an abnormal communication between the bladder and vagina, which results in continuous involuntary loss of urine through the vagina. It is among the most distressing and socially devastating conditions among women, and occurs most commonly as a result of obstetrical and gynecological injury.¹ The overall incidence of VVF because of gynecological surgery is estimated to be 1 of every 1200 hysterectomies and 1 of every 455 laparoscopic hysterectomies.² The uncontrolled leakage of urine into the vagina is the hallmark symptom of patients with Urogenital Fistula. Increased post-operative abdominal, pelvic, or flank pain; prolonged ileus; and fever should alert the physician to possible urinoma or urine ascites and mandates expeditious evaluation. Recurrent cystitis or pyelonephritis, abnormal urinary stream, and hematuria also should initiate a workup for UGF.^{3,4,5} The time from initial insult to clinical presentation depends on the etiology of the VVF. A VVF secondary to a bladder laceration typically presents immediately. Approximately 90% of genitourinary fistulas associated with pelvic surgery are symptomatic within 7 – 30 days postoperatively.^{6,7} An anterior vaginal wall laceration associated with obstetric fistulas typically (75%) presents in the first 24 hours of delivery.^{5,8} Although vesicovaginal fistulas (VVF) are the most commonly acquired fistulas of the urinary tract, we lack a standardized algorithm for their management⁹ Multiple different surgical

routes like Latzko repair, open transabdominal, transvaginal, laparoscopic, robotic, transurethral endoscopic with or without tissue interposition have been described^{10,11,12} The approach is dependent on many factors, particularly on the experience of the surgeon. In general, simple fistulas are treated using the vaginal approach, whereas complex fistulas are commonly treated using an abdominal approach.¹³⁻¹⁵ The abdominal approach has enjoyed reproducible and durable success from 94-100%.^{17,18} World health organization (WHO) proposes the successful closure rate for first repair at 85% in each facility with the continence achievement among the closed cases at 90 % .The aim of the study is to find out the Outcome of open transvesical repair of vesicovaginal fistulae in comparison to transperitoneal repair. Vesicovaginal fistula (VVF), commonly caused by prolonged obstructed labor, is one of the worst complications of childbirth and poor obstetric care in the developing world like in Bangladesh. Though the incidence is not known large number of vesicovaginal fistula patient is hospital burden in Bangladesh. Surgical repair is the main stay of treatment and first chance is the best chance in repair of VVF. Repair of genitourinary fistula remains a major challenge to surgeons worldwide with many acceptable surgical techniques. Although the choice of technique partly depends on the characteristics of the fistula (site, size, clinical context), it also largely depends on the experience of the surgical team and there is no appropriate best technique of repair. The management of VVF involves a multi-modal technique. The repair could be undertaken through the transabdominal or transvaginal route or a combined approach. Abdominal approach has enjoyed reproducible and durable success from 94-100%.^{17,18} The abdominal approach (Transvesical and transperitoneal approach) may be used to treat all types of VVF as it is the preferred approach in complex situations when the fistula is high verity, large (wider than 4 cm), or when ureteral orifices are involved in the fistula and ureteral re-implantation is required and also used when VVF repair failed by vaginal route. In abdominal route one can repair it through urinary bladder and one can repair transperitoneal approach. In spite of large-scale research on VVF, there are very few studies addressing the factors which predict the possible outcome of surgical repair. The current study was planned to review the outcome of open transvesical surgical repair in comparison to transperitoneal repair of VVF in tertiary level hospital surgical settings as abdominal approach may be used to treat all types of VVF.

II. Objectives of the study:

General:

To see the Outcome of Open Transvesical Repair of Vesicovaginal Fistulae in comparison to transperitoneal repair.

Specific:

To see the success rate of open transvesical repair of vesicovaginal fistula.

To see the success rate of open transperitoneal repair of vesicovaginal fistula

To see the success rate of open transvesical repair of vesicovaginal fistula in comparison to transperitoneal extravasical repair according to age of the patient, aetiology of vesicovaginal fistulae, duration of vesicovaginal fistulae.

To see the presence of LUTS/ Voiding symptoms following open transvesical repair of vesicovaginal fistula in comparison to transperitoneal extravasical repair.

III. Literature review

Vesicovaginal fistula (VVF) is the most frequent type of acquired fistulas and causes both physical and psychosocial morbidity. In underdeveloped countries, VVFs occur due to obstetric complications when there is limited access to prenatal and obstetric care. In industrialized countries, VVFs usually occur as a complication of gynecological, urological or abdominal pelvic surgeries; other causes include malignant illnesses and radiotherapy of the pelvis.^{19,20} Vesicovaginal fistula comprises a major burden of obstetrical procedures-related morbidity in developing countries, as well as having a drastic social impact on quality of life. The first recorded reference to VVF was in 1950 BC. VVF has been a social stigma for women for centuries. The occurrence of VVF goes back to more than 2000 BC, when it was identified in 1935 in an Egyptian mummy.²¹ Avicenna first described the relationship between VVF and obstructed labor or iatrogenic injury in 1037²². While Derry in 1935, noted a large VVF that he concluded was the consequence of obstructed labor.²³ The first successful management of VVF was achieved by John Fatio in 1675, while Sims, the father of surgery, performed VVF repair successfully in 1849 with silver wire sutures. The management of VVF remains controversial as regard to time and surgical approach.^{24,25} The rate of iatrogenic bladder injury during abdominal hysterectomy is estimated to be between 0.5% and 1.0% The incidence of fistula after hysterectomy is estimated to be approximately 0.1% to 0.2% Post hysterectomy VVF are thought to result most commonly from an incidental unrecognized iatrogenic cystotomy near the vaginal cuff. Other potential mechanisms for post hysterectomy VVF include tissue necrosis from cautery, a suture placed through both the bladder and vaginal wall during closure of the vaginal cuff, or an attempt to control pelvic bleeding by suture ligation.²⁶ In developing countries, the

predominant cause of vesicovaginal fistula is prolonged obstructed labor (97%). In developed countries iatrogenic vesicovaginal fistula is a complication of many procedures, comprising up to 90% of VVF in those countries. Risk factors that predispose to VVFs include prior pelvic or vaginal surgery, previous PID, ischemia, diabetes, arteriosclerosis, carcinoma, endometriosis, anatomic distortion by uterine myomas, and infection, particularly postoperative cuff abscess. Other less common causes of vesicovaginal fistula include pelvic malignancy, pelvic irradiation, obstetric trauma and infection, including tuberculosis.²⁷ Congenital vesicovaginal fistula is very rare and may result from an abnormality of fusion of the lower end of the Mullerian duct with the urogenital sinus. The condition is usually associated with other urinary tract anomalies; isolated cases are extremely rare.²⁸ The uncontrolled leakage of urine into the vagina is the hallmark symptom of patients with UGFs. Increased post-operative abdominal, pelvic, or flank pain; prolonged ileus; and fever should alert the physician to possible urinoma or urine ascites and mandates expeditious evaluation. Recurrent cystitis or pyelonephritis, abnormal urinary stream, and hematuria also should initiate a workup for UGF.²⁹ The time from initial insult to clinical presentation depends on the etiology of the VVF. A VVF secondary to a bladder laceration typically presents immediately. Approximately 90% of genitourinary fistulas associated with pelvic surgery are symptomatic within 7 – 30 days postoperatively.³⁰ An anterior vaginal wall laceration associated with obstetric fistulas typically (75%) presents in the first 24 hours of delivery. The frequency, etiology and presentation of VVF differ from country to country and within various regions of the same country.³¹ Generally, the time to onset is 7–10 days after surgery, but can range from immediate to 6 weeks. Occasionally, urine leakage becomes apparent in the immediate postoperative period. VVF can also develop at a distant interval after pelvic irradiation or secondary to local malignancy, with some reports of up to 20 years between radiotherapy and fistula formation.³² A differential diagnosis should include urinary incontinence, especially overflow incontinence, as this is continuous. Other causes of vaginal fluid include an ectopic ureter, a watery discharge from the vagina or cervix, and rarely from the uterus or Fallopian tubes. Biochemical analysis of the fluid can help differentiate urine from serous fluid. Direct visualization and assessment of the defect on vaginal and cystoscopic examination is helpful in planning surgical repair. The use of methylene blue solution intravesically can assist in determining the site of the fistula. Ten to fifteen per cent of all VVF have been found to have coexistent ureteric injury and therefore assessment of the upper urinary tract is mandatory with either intravenous urogram (IVU) or retrograde pyelography at the time of cystoscopic examination.³² Diagnosis can be established by filling the bladder with methylene blue, inserting a tampon in the vagina and asking the patient to ambulate. Cystoscopy has prime importance in accurate mapping of a fistula, which helps in the future management plan.³³

Surgical repair:

Regardless of the technique used and the timing of surgery, the principles that underpin VVF repair remain the same. The repair should be tension-free, watertight and uninfected. The tissues at the site of the repair should be healthy and a well-vascularized interposition flap should be used if required as in most surgery, the first attempt at a surgical repair is the most effective, and the most likely to succeed. The choice of surgical approach should be determined by the surgeon's skill with the specific technique. VVF repair can be approached transvaginally, transabdominally, or in a combined approach if necessary. Surgical repair has success rates of up to 95% while open surgical repair is the gold standard for VVF repair.³⁴

Transabdominal Route:

A transabdominal approach to fistula repair is indicated if the vaginal exposure of the fistula defect is inadequate (high vaginal defect, retracted defect or narrow vagina), or the fistula is closely related to the distal ureters. The main advantage of a transabdominal approach is that the omentum can be used as a large interposition flap. This makes it the preferred approach for repair of complex, multiple or recurrent fistulae, or when there is a history of pelvic irradiation or coexisting pelvic pathology. It also allows creation of an ileal conduit for urinary diversion in cases that prove to be beyond repair, where patients have been preoperatively counseled regarding such a possible outcome.^{34, 35}

a) Transperitoneal Approach:

The transperitoneal approach involves bisection of the bladder from the dome down the posterior wall to the fistula site. [15] Ureteric catheters can be placed to identify and protect the ureters during the procedure. The bladder is mobilized away from the vagina and the fistula excised. The bladder and vagina are then closed separately. The omentum is mobilized and brought down to interpose between them and can be secured into position with one or two sutures if required.

b) Extraperitoneal Transvesical Approach:

An extra peritoneal abdominal approach has been reported for the repair of small simple fistulae in which an anterior cystotomy allows access to the bladder and a free bladder mucosal graft is used to close the fistula defect. As exposure is limited with this technique and the use of omentum as an interposition graft precluded, most surgeons favor the intraperitoneal trans abdominal approach described previously.^{34,36} Continuous bladder drainage via a urethral catheter is imperative. Inadequate bladder drainage is a common cause of failure of the repair. Bladder spasms can be treated effectively with anticholinergic drugs. There is a concern that these spasms may compromise healing as well as being a source of patient discomfort.³⁵ The success of VVF repair at the first attempt is approximately 85% for both trans abdominal and transvaginal techniques. Vaginal stenosis is rare and may require further surgery to make relaxing incisions or to site skin grafts. Infection should be promptly addressed and treated. Repeated repairs will often require the use of soft-tissue grafts. Stenting or percutaneous drainage can be used to allow further healing, or for drainage of a urinoma or abscess³⁷

IV. Material and Methods:

Study design, study place and period:

This is a prospective observational study which was carried out at the Department of Urology, Dhaka Medical College Hospital, Dhaka, Bangladesh during the period from January 2018 to December 2018. This study was carried on patients who were diagnosed as Vesicovaginal Fistula on clinical examination and cystoscopic examination. A total of 32 cases were selected. It was a prospective observational study.

Study population: Vesicovaginal Fistulae patient of Urology Department of Dhaka Medical College Hospital, Dhaka aged 18 years and above, admitted in DMCH.

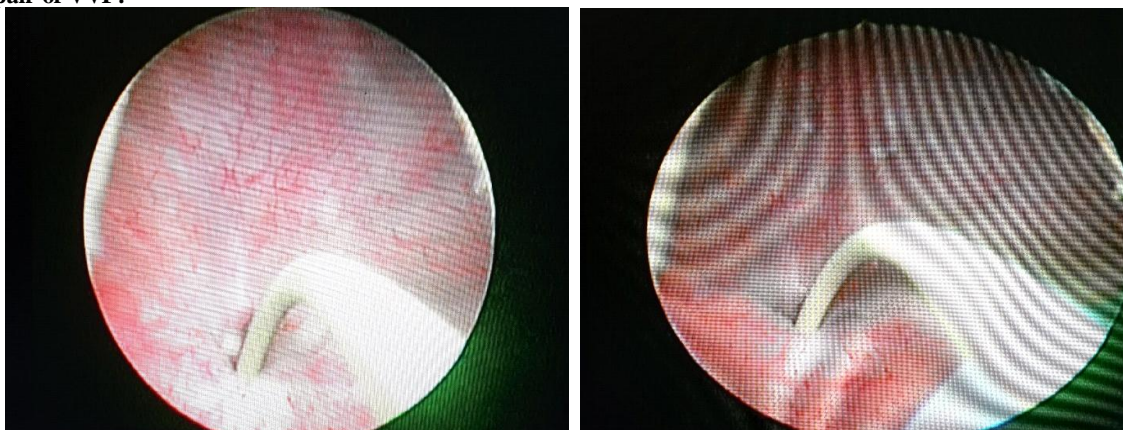
Sample size: A total of 32 cases who met the above enrollment criteria were included in this study.

Screening method: History and clinical examination and cystoscopic findings.

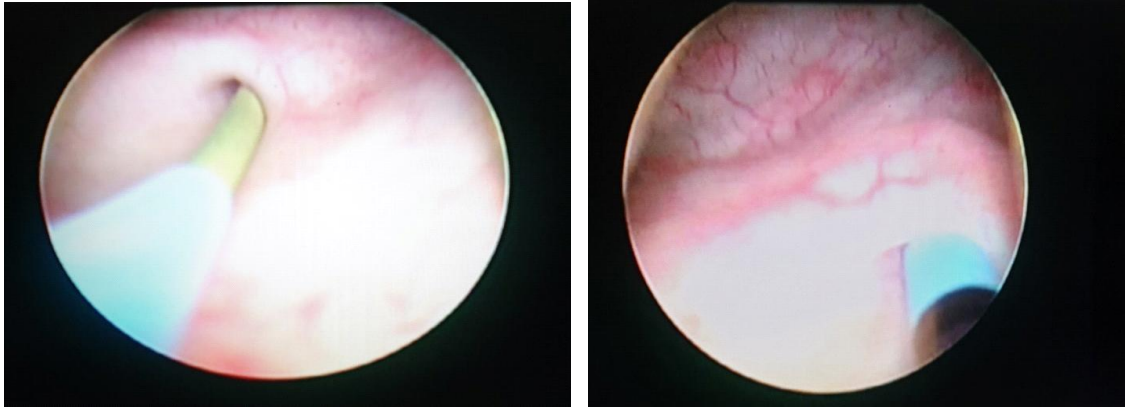
Sampling method: Purposive, every patient was evaluated by clinical examination, appropriate investigations and after a confirm diagnosis by cystoscopy. All patients undergone operative intervention. First attended patient was taken on the basis of lottery. All the odd numbered cases were allocated for Group - A (transvesical approach) and the even numbered cases were allocated for Group - B (transperitoneal approach). The first case entering into the operation theater was allocated to Group - A (transvesical) and the next patient was allocated to Group - B (transperitoneal) and the patient was in a post-operative follow up to evaluate the outcome.

Procedure of collecting data: To do this study ethical clearance was taken from institutional ethical committee of Dhaka Medical College, Dhaka. Total 32 patients aged 18 years and above without consideration of gender with a clinical diagnoses of high variety of vesicovaginal fistula and confirmed by cystoscopic examination was selected purposefully. The clinical history including age, sex, socioeconomic condition, findings were recorded in a definite proforma. Clinical parameters and the reports of the investigations was used to confirm the diagnosis and surgical intervention was done then the follow up was recorded. All information was properly recorded in the predesigned data sheet.

Repair of VVF:



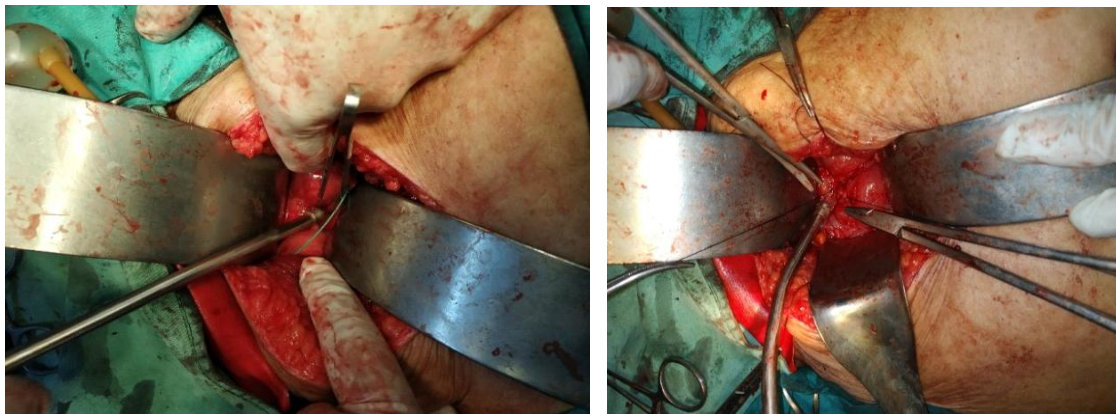
Picture 1: Cystoscopy and insertion of guide wire through VVF tract.



Picture 2: Bilateral DJ Stenting

The steps of the technique of open trans vesical repair:

Vaginoscopy, Cystoscopy, Bilateral DJ stenting, Transverse lower abdominal incision, Layer by layer dissection, Incision of bladder, Excision and freshening of fistulous margins after complete separation of bladder from vagina. Closure of vaginal opening horizontally and bladder opening vertically with interrupted polyglactin sutures and Urethral catheterization for 21 days.



Picture 3: Closure of vaginal opening horizontally and bladder opening vertically with interrupted vicryl sutures.

The steps of the technique of open transperitoneal repair:

Vaginoscopy, Cystoscopy, Bilateral DJ stenting, Lower midline abdominal incision, Layer by layer dissection Incision of bladder upto VVF opening intra peritoneal approach. Excision and freshening of fistulous margins after complete separation of bladder from vagina. Closure of vaginal opening horizontally and bladder opening vertically with interrupted vicryl sutures. Interposition of omentum between these suture lines

Urethral catheterization for 21 days.



Picture 4: Incision of bladder up to VVF opening intra peritoneal approach

Post-operative Outcome: Outcome of the repair was assessed by success rate Complications- 1. Injury to the adjacent structure, 2. Post operative Ileus, 3. Wound infection, 4. Haematoma formation., 5. Vesicovaginal fistula., 6. Recurrence

7. LUTS

Follow up of the patient: Our Follow up plan was -3 Follow up Schedule and After 3 weeks, After 6 weeks and After 3 months.

Procedure of data interpretation: Data was analyze by SPSS-PC+ Programme for Windows 22.00 version. In descriptive statistics, the frequency, percentage, mean and standard deviation will be included. Important tables was prepared on the basis of the findings relevant to the study.

Statistical significance: For qualitative data: Chi-square Test(χ^2) and for quantitative data: Students' t Test.

V. Observations And Results

A total of 32 patients with Vesicovaginal Fistula were enrolled in the study. Cystoscopic evaluation was done in all cases and definite operative procedure was done (Transvesical repair 16 cases and Transperitoneal repair 16 cases). All patient was in a post-operative follow up for the evaluation of surgical outcome. All the data were recorded in data sheet along with patient's clinical findings. All patients were house wife and unemployed. All patient had a history of previous surgery- post operative VVF. All fistulas were supratrigonal (high variety) average size was 1.5/1.5cms. We used pre-operative bilateral DJ stenting in all patient. There was no injury to adjacent structure during the surgery. No haematoma formation in post-operative period. We did not put SPC in any case. Fistula repair was successful in 29 cases, with mean operative time of 233 minutes(range 150-330 minutes). Mean hospital stay 7 days (3-16 days). At 21 days follow up, Foley's catheter was removed. At 6 weeks and 3 months follow up 29 patients continued to void normally without any recurrence of VVF.

Age distribution of the patients

Age ranged between 18 to 45 years and the mean age is 33 yrs, minimum age 20 yrs, maximum age 45 yrs and standard deviation 7. Total subjects were divided into six age groups.

Table 1: Distribution of 32 study subjects in different age groups.

Age (in year)	Total (n=32)	Percent (%)
18-20	2	6.3
21-25	3	9.4
26-30	11	34.4
31-35	7	21.9
36-40	3	9.4
41-45	6	18.8
Total	32	100

Table 2: Distribution of 32 study subjects and operative group:

Age	Group	
	Group A (Trsansvesical Route) (n = 16)	Group B (Transperitoneal Route) (n = 16)
18-20	2	0
21-25	2	1
26-30	4	7
31-35	4	3
36-40	2	1
41-45	2	4

Duration of VVF

Their duration of VVF ranged between minimum 6 months to maximum 36 months and the mean duration was 16 months. Total subjects were divided into five groups.

Table 3: Duration of VVF of 32 study subjects.

Duration(Months)	Total (n=32)	Percent
6-12	12	37.5
13-18	10	31.3
19-24	5	15.6
25-31	2	6.3
31-36	3	9.4

Table 4: Duration of VVF in the Study groups in relation with operative groups.

Age	Group	
	Group A (Trsansvesical Route) (n = 16)	Group B (Transperitoneal Route) (n = 16)
6-12	7	5
13-18	3	7
19-24	4	1
25-30	2	0
31-36	0	3

Cause of VVF:

Table 3.6.0 shows Surgical history of the study patients, it was observed that majority of the patients had history of hysterectomy. 26(81.3%) had history of hysterectomy, 6 (18.8 %) had history of LUCS.

Table 5: Distribution of the study patients by past surgical status (n=32).

Surgical History of	Number of patients	(%)
Hysterectomy	26	81.3
LUCS	6	18.8

Past Surgical History in the study groups.

3.7.0 shows Surgical history of the study patients, it was observed that majority of the patients had history of hysterectomy. 26(81.25 %)had history of hysterectomy (Group A and Group B), 6 (18.75 %) had history of LUCS (Group A and Group B)

Table 6: Past Surgical History in the study groups.

Surgical History	Group		p value
	Group A (Trsansvesical Route) (n = 16)	Group B (Transperitoneal Route) (n = 16)	
Hysterectomy	13	13	0.500
LUCS	3	3	

Data were analyzed using Chi-Square Test and level of significance was < 0.05.

Post-operative outcome of the study groups:

In this study overall success is 29 (90.6%) and Failure 3(9.4%)

Table 7: Distribution of Post-operative outcome of the study groups.

Outcome	Group		P value
	Group A (Trsansvesical Route) (n = 16)	Group B (Transperitoneal Route) (n = 16)	
Success	14	15	0.305
Failure	2	1	

Data were analyzed using Chi-Square Test and level of significance was < 0.05

Wound Infection in the study groups.

Wound infection present in transvesical group is 5(31.25), and in Transperitoneal group is 0 (00%)

Table 8: Distribution of Wound Infection in the study groups.

Wound Infection	Group		P value
	Group A (Trsansvesical Route) (n = 16)	Group B (Transperitoneal Route) (n = 16)	
Present	5	0	0.060
Absent	11	16	

Data were analyzed using Chi-Square Test and level of significance was < 0.05.

Post-operative Hospital stay:

Post-operative hospital stay is more in study group A and less in group B. Mean Hospital stay is 7 days (minimum stay 3 days and maximum stay 16 days).

Table 9: Distribution of Post-operative Hospital stay of study groups.

Duration (Days)	Group		p value
	Group A (Trsansvesical Route) (n = 16)	Group B (Transperitoneal Route) (n = 16)	
1-3	2	0	0.041
4-7	5	16	
>7	9	0	

Data were analyzed using Student -T Test and level of significance was < 0.05.

Post-operative Complication among the study patients

Pie chart showing that post-operative ileus was seen in 5(15.6%) cases, Wound infection 5 (15.6%) , Hematoma Formation in 2(6.3%) case, VVF in 1(3.1%) case and no complication was in 19(59.4%) cases. 1- Post Operative Illius, 2-Wound Infection,3-Haematoma Formation, 4-VVF,5-No Complication

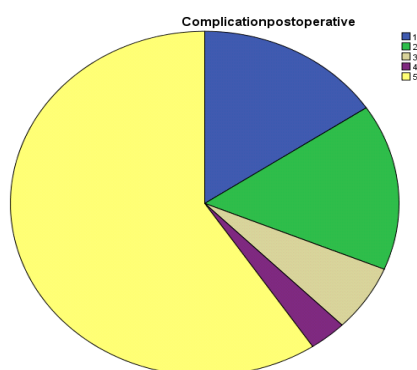


Fig: 2 Pie diagram showing Post-operative Complication among the study patient.

Table 10: Distribution of Post-Operative Complication in Study Groups

Post-Operative Complication	Group		p value
	Group A (Trsansvesical Route) (n = 16)	Group B (Transperitoneal Route) (n = 16)	
Post operative Illius	0	5	.092
Wound Infection	5	0	
Haematoma Formation	2	0	
VVF	1	0	
No Complication	8	11	

Data were analyzed using Chi-Square Test and level of significance was < 0.05.

Lower Urinary Tract Symtoms:

Lower urinary tract symtoms more in Transvesical group 3(18.75%) and less in transperitoneal group 1(6.25%).

Table 11: Distribution of Lower Urinary Tract Symtoms in study groups.

LUTS	Group		p value
	Group A (Trsansvesical Route) (n = 16)	Group B (Transperitoneal Route) (n = 16)	
Present	5	1	0.264
Absent	11	15	

Data were analyzed using Chi-Square Test and level of significance was < 0.05.

At 6 weeks follow up: Routine Clinical Evaluation and Pervaginal Examination. 29 patients continued to void normally without any recurrence of VVF. 3 cases with pervaginal leakage of urine.

At 3 months follow up: Routine clinical evaluation and urethrocystoscopy, 29 patients continued to void normally without any recurrence of VVF. 3 cases of supratrigonal VVF on urethrocystoscopy.

VI. Discussion

The occurrence of vesicovaginal fistula is almost obsolete in developed countries while still a reasonable size of population faces the problem in under developed nations. The obstetrical causes are commonest etiological factor in third world causing destruction of bladder base and urethra with compression against pubic bone during prolonged obstructed labor, instrumental deliveries or handling by untrained birth

attendants.³⁷ Vesicovaginal fistula in developed countries mostly occurs after pelvic surgery i-e abdominal hysterectomies, which occur in 0.05 – 0.5 / 100 cases. The obstetric etiology of VVF in developing countries is almost 70 – 95.³⁸ Hysterectomy is the most common surgical procedure resulting in VVF formation in developed countries, with an 80% incidence. Other gynecological procedures account for up to 11%.³⁹ In our study the cause of VVF was abdominal and vaginal hysterectomy in 26 (85%) patients and LUCS in 06 (15%) patient developed VVF after the LUCS.³⁹ This study mainly stressed over comparison of outcome following the repair with open transvesical and transperitoneal repair. In diagnosis of VVF, it was important to confirm that discharge was urine and leakage was extra-urethral. Although past history and clinical presentation gives clue to the diagnosis but gynaecologists claim dye test as an investigation of choice.⁴⁰ In this study diagnostic test was examination under sedation including cystoscopy and speculum examination of vagina. Age of patients affected by VVF vary greatly between country to country and even in different regions of same country.⁴² Our study observed age range between 20 to 45 years (mean age 32 Years). The timing of repair after the occurrence of VVF is the most controversial aspect of repair surgery of VVF. Although early repair is now being advocated by some authors, but most would agree that 8 – 12 weeks after VVF occurrence is the earliest appropriate time to repair. Pressure from patients for earlier repair should be resisted and 08 weeks is minimum time allowed between attempt at repair and VVF occurrence.⁴² In this study minimum time lapse was 6 months and the maximum time was 36 months mean duration was 16 months. Because in our country delay in diagnosis and delay in treatment due to patient load tertiary healthcare center. Success rate after abdominal repair of VVF is reported to be 85% to 100% in different studies⁴⁴ Abdominal repair can be extraperitoneal or intraperitoneal with or without omental graft.³¹ In our study success rate of transperitoneal repair is 93.75% and in transvesical repair is 87.5% and overall success rate is 90.62%. It is difficult to prove the superiority of one surgical technique over another due to fistula etiology, location, and clinician's expertise. Each fistula is unique. Surgeon will often be required to individually vary their approach and technique. In our study transperitoneal approach is better to some extent in respect of post-operative outcome. Wound infection 5(31.25%) in transvesical group and nil in trans peritoneal group, LUTS is 3(18.75%) in transvesical groups and 1(6.25%) in trans peritoneal groups, mean hospital stay 7 days but more in transvesical groups. The follow-up period in our study was on average 6 months (3-9months). Different studies have variable period of follow-up from 07 months to 35 months.³⁸ Cure rates should be considered in terms of closure at first attempt. On average one might anticipate 80% cure with 10% failure rates.³⁹ In our study success rate of transperitoneal repair is 93.75% and in transvesical repair is 87.5% and overall success rate is 90.62%.

Limitation of Study: Small Sample Size, Single Centre study and Omental Flap was given only in transperitoneal group.

VII. Conclusion and recommendation

Open transperitoneal repair of VVF is the tried and tested method of VVF repair. We conclude that open transperitoneal repair of vesico vaginal fistula is a safe and efficient method of supratrigonal vesico vaginal fistula repair. Further large scale study is needed to establish the abdominal – transperitoneal repair the best modalities of surgical repair for :- Supratrigonal Post-surgical VVF.

References:

- [1]. Muhammad AM, Muhammad S, Muhammad TBM, Nauman K. Changing trends in the etiology and management of vesicovaginal fistula. *Int J Urology* . 2018;25:25-29. doi: 10.1111/iju.13419
- [2]. Milicevic S, Krivokuca V, Ecim-Zlojutro V, Jakovljevic B. Treatment of vesicovaginal fistulas: an experience of 30 cases. *Med Arch*. 2013;67:266-9. doi: [10.5455/medarh.2013.67.266-269](https://doi.org/10.5455/medarh.2013.67.266-269)
- [3]. Hanash KA, Al Zahrani H, Mokhtar AA. Retrograde vaginal methylene blue injection for localization of complex urinary fistulas. *J Endourol*. Dec 2003; 17 (10): 941-3. doi:[10.1089/089277903772036334](https://doi.org/10.1089/089277903772036334)
- [4]. Hilton P. Vesicovaginal fistula: new perspectives. *Curr Opin Obstet Gynaecol* 2001; 13: 513-20. doi: [10.4103/0970-1591.32073](https://doi.org/10.4103/0970-1591.32073)
- [5]. Pushpa SS. Surgical repair of vesicovaginal fistulae. *JCPSP* 2002; Vol. 12 (4): 223-226. doi: [10.4103/0970-1591.65400](https://doi.org/10.4103/0970-1591.65400)
- [6]. Lentz SS. Transvaginal repair of the posthysterectomy vesicovaginal fistula using a peritoneal flap: the gold standard. *J Reprod Med*. Jan 2005; 50 (1): 41-4. doi: 10.7439/ijbr.v4i3.236
- [7]. Vyas N, Nandi PR, Mahmood M, Tandon V, Dwivedi US, Singh PB. Bladder mucosal autografts for repair of vesicovaginal fistula. *BJOG*. Jan 2005; 112 (1): 112-4. Doi: 10.4103/2277-9175.102984
- [8]. Maimoona H, Shaheena A, Hajira H. Profile and repair success of vesicovaginal fistula in Lahore. *JCPSP*. 2005; Vol. 15 (3): 142-44. doi: [org/10.21649/akemu.v17i1.276](https://doi.org/10.21649/akemu.v17i1.276)
- [9]. Oakley SH, Brown HW, Greer JA, Richardson ML, Adelowo A, Yurteri-Kaplan L et al. Management of vesicovaginal fistulae: a multicentre analysis from the Fellows Pelvic research Network. *Female pelvic Med Reconstr Surg*. 2014; 20(1): 7–13. doi: [10.1097/SPV.0000000000000041](https://doi.org/10.1097/SPV.0000000000000041)
- [10]. Raz S, Bregg KJ, Nitti VW, Sussman E. Transvaginal repair of vesicovaginal fistula using a peritoneal flap. *J urol*. 1993; 150: 56–59. doi: [10.4103/0970-1591.36709](https://doi.org/10.4103/0970-1591.36709)
- [11]. McKay HA. Vesicovaginal fistula repair: Transurethral suture cystorrhaphy as a minimally invasive alternative. *J Endourol*. 2004; 18: 487–490. doi: [10.1089/0892779041271427](https://doi.org/10.1089/0892779041271427)
- [12]. Iselin CE, Alsan P, Webster GD. Transvaginal repair of vesicovaginal fistulas after hysterectomy by vaginal cuff excision. *J Urol*. 1998; 160: 728–730. doi: [10.1371/journal.pone.0171554](https://doi.org/10.1371/journal.pone.0171554)
- [13]. Woo HH, Rosario DJ, Chapple CR. The treatment of vesicovaginal fistulae. *Eur Urol*. 1996;29:1-9. doi:10.4103/0970-1591.36709

- [14]. Eilber KS, Kavalier E, Rodriguez LV, Rosenblum N, Raz S. Ten-year experience with transvaginal vesicovaginal fistula repair using tissue interposition. *J Urol.* 2003;169:1033-6. doi: [10.4103/0976-7800.185332](https://doi.org/10.4103/0976-7800.185332)
- [15]. Hadley HR. Vesicovaginal fistula. *Curr Urol Rep.* 2002;3:401-7. doi: [10.4103/0970-1591.36709](https://doi.org/10.4103/0970-1591.36709)
- [16]. Sims JM. On the treatment of vesicovaginal fistula. *Am J Med Sci.* 1852;23:59. doi: [10.4103/0970-1591.65400](https://doi.org/10.4103/0970-1591.65400)
- [17]. Lee RA, Symmonds RE, Williams TJ. Current status of genitourinary fistula. *Obstet Gynecol* 1988;72:313-9. doi: [10.4103/0970-1591.32073](https://doi.org/10.4103/0970-1591.32073)
- [18]. Nanninga JB, O'Connor VJ Jr. Suprapubic transvesical closure of vesicovaginal fistula: Buchsbaum HJ, Schmidt JD, editors. *Gynecologic and obstetric Urology.* WB Saunders Co: Philadelphia; 1993. p. 365-9. doi: [10.4103/0970-1591.32073](https://doi.org/10.4103/0970-1591.32073)
- [19]. Singh O, Gupta SS, Mathur RK. Urogenital fistulas in women: 5-year experience at a single center. *Urol J.* 2010;7:35-9. doi: [10.1007/s13224-015-0672-2](https://doi.org/10.1007/s13224-015-0672-2)
- [20]. Milicevic S, Krivokuca V, Ecim-Zlojutro V, Jakovljevic B. Treatment of vesicovaginal fistulas: an experience of 30 cases. *Med Arch.* 2013;67:266-9. doi: [10.5455/medarh.2013.67.266-269](https://doi.org/10.5455/medarh.2013.67.266-269)
- [21]. Santosh K, Nitin SK, Ganesh G. Vesicovaginal fistula. An update. *Indian J. Urol.* 2007; 23: 187–91. Doi: 10.4103/0970-1591.32073
- [22]. Ghoniem GM, Khater UM. Vesicovaginal fistula. Pelvic floor dysfunction. Springer-Verlag, London, 2006. doi: [10.1016/j.aju.2013.11.006](https://doi.org/10.1016/j.aju.2013.11.006)
- [23]. Ghoniem GM, Khater UM. Vesicovaginal fistula. Pelvic floor dysfunction. Springer-Verlag, London, 2006. doi: [10.1016/j.aju.2013.11.006](https://doi.org/10.1016/j.aju.2013.11.006)
- [24]. Andreoni C, Bruschini H, Truzzi JC, Simonetti R, Srougi M. Combined vaginoscopy – cystoscopy : a novel simultaneous approach improving vesicovaginal fistula evaluation. *J Urol.* Dec 2003; 170 (6 Pt 1): 2330-2. doi: [10.1097/01.ju.0000096343.03276.75](https://doi.org/10.1097/01.ju.0000096343.03276.75)
- [25]. Angioli R, Penalver M, Muzii L, Mendez L, Mirhashemi R, Bellati F. Guidelines of how to manage vesicovaginal fistula. *Crit Rev Oncol Hematol.* Dec 2003; 48 (3): 295-304
- [26]. Yogesh K, Radhakrishnan R. Efficiency and Post Operative Outcome of Open Transvesical Repair of Vesicovaginal Fistula-Our Experience in 20 Cases. *Journal of Dental and Medical Sciences.* 2015;4:66-68. Doi: 10.9790/0853-14416668
- [27]. Tahzib F. Epidemiological determinants of vesicovaginal fistulas. *Br. J. Obstet. Gynaecol.* 1983; 90: 387–91. doi: [10.4103/0974-7796.102660](https://doi.org/10.4103/0974-7796.102660)
- [28]. Hilton P. Surgical fistulae and obstetric fistulae. In: Cardozo LD, Staskin D (eds). *Textbook of Female Urology and Urogynaecology.* Isis Medical Media Ltd, London, 2001; 691–719. doi: 10.1007/s12262-012-0787
- [29]. Hanash KA, Al Zahrani H, Mokhtar AA. Retrograde vaginal methylene blue injection for localization of complex urinary fistulas. *J Endourol.* Dec 2003; 17 (10): 941-3. doi: [10.1089/089277903772036334](https://doi.org/10.1089/089277903772036334)
- [30]. Lentz SS. Transvaginal repair of the posthysterectomy vesicovaginal fistula using a peritoneal flap: the gold standard. *J Reprod Med.* Jan 2005; 50 (1): 41-4. DOI:10.7439/ijbr
- [31]. CODEN:IJBRFA
- [32]. Flynn MK, Peterson AC, Amundsen CL, Webster GD. Functional outcomes of primary and secondary repairs of vesicovaginal fistulae via vaginal cuff scar excision. *Int Urogynecol J Pelvic Floor Dysfunct.* Nov – Dec 2004; 15 (6): 394-8. doi: 10.4172/2167-0420.1000156
- [33]. Beena V, Manish C, Deep P, Vipul C, Taha D, Ritesh S. Bladder injuries during obstetrical and gynecological surgeries. *Int. Surgery J.* 2017 Jul;4(7):2177-2180. doi: 10.18203/2349-2902.isj20172578.
- [34]. Adetiloye VA, Dare F. Obstetric fistula: evaluation with ultrasonography. *J. Ultrasound Med.* 2000; 19: 243–9. doi: 10.9734/JAMMR/2017/34782
- [35]. Mary G, Neil H. Vesicovaginal fistulae. *Indian J of Urology.* 2010;29(26):253-256. doi: 10.4103/0970-1591.65400
- [36]. Carr LK, Webster G. Abdominal repair of vesicovaginal fistula. *Urology* 1996;48:10-1
- [37]. Gil-Vernet JM, Gil-Vernet A, Campos JA. New surgical approach for treatment of complex vesicovaginal fistula. *J Urol* 1989;141:513-6.
- [38]. Blaiavas JG, Heritz DM, Romanzi LI. Early versus late repair of vesicovaginal fistulas: vaginal and abdominal approaches. *J Urol* 1995;153:1110-3
- [39]. Angioli R, Penalver M, Muzii L, Mendez L, Mirhashemi R, Bellati F. Guidelines of how to manage vesicovaginal fistula. *Crit Rev Oncol Hematol.* Dec 2003; 48 (3): 295-304
- [40]. Hilton P. Vesicovaginal fistula: new perspectives. *Curr Opin Obstet Gynaecol* 2001; 13: 513-20
- [41]. Hanash KA, Al Zahrani H, Mokhtar AA. Retrograde vaginal methylene blue injection for localization of complex urinary fistulas. *J Endourol.* Dec 2003; 17(10):9413. doi: [10.1089/089277903772036334](https://doi.org/10.1089/089277903772036334)
- [42]. Wall LL, Arrowsmith SD, Briggs ND. The obstetric vesicovaginal fistula in the developing world. *Obstet Gynecol Surv.* Jul 2005: 60
- [43]. Vyas N, Nandi PR, Mahmood M, Tandon V, Dwivedi US, Singh PB. Bladder mucosal autografts for repair of vesicovaginal fistula. *BJOG.* Jan 2005; 112 (1): 112-4. doi: [10.1111/j.1471-0528.2004.00316.x](https://doi.org/10.1111/j.1471-0528.2004.00316.x)
- [44]. Hilton P. Vesicovaginal fistula in developing countries. *Int J Gynaecol Obstet (Ireland),* 2003; 82: 285-95. doi: [10.1016/S0020-7292\(03\)00222-4](https://doi.org/10.1016/S0020-7292(03)00222-4)
- [45]. Akter S, Mujib F, Rahman MM. Surgical Outcome of Vesico-Vaginal Fistula (VVF) after Repair: Experience of 51 Cases in a Teaching Hospital of Dhaka City. *Journal of National Institute of Neurosciences Bangladesh* ,2019;5(1):29-32. doi.org/10.3329/jninb.v5i1.42165

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