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RESEARCH ARTICLE
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IMPACT OF VESICOVAGINAL FISTULA REPAIR ON URINARY AND SEXUAL FUNCTION: A CROSS-SECTIONAL STUDY

Dr. Nosheela Amjad[1], Dr. Sidra Rauf[2*], Dr. Sobia Luqman[3], Dr. Sadia Aftab[4], Dr. Mussarat Batool[5], Dr. Shirza Sharafat[6]

[1]Professor Obs and Gynae Pakistan Institute of Medical Sciences noshelamuhammad@gmail.com
[2*]Pgr obs gynae Pakistan Institute of Medical Sciences me.sidrarauf13@gmail.com
[3]Assistant Professor Obs and Gynae Pakistan Institute of Medical Sciences sobialuqman8@gmail.com
[4]Assistant Professor Obs and Gynae Pakistan Institute of Medical Sciences aftabsadia28@gmail.com
[5]Assistant Professor Obs and Gynae Pakistan Institute of Medical Sciences Mussratbatool@live.com
[6]Medical Officer Obs and Gynae Pakistan Institute of Medical Sciences thumblina_shirza@hotmail.com

***Corresponding Author:** Dr. Sidra Rauf
*Pgr obs gynae Pakistan Institute of Medical Sciences me.sidrarauf13@gmail.com

Abstract

Objectives:
The study looks at the outcomes of a VVF repair surgery with regard to the patients' urinary and sexual function in a clinical setting.

Methods: A descriptive cross-sectional survey was conducted in MCH, PIMS Islamabad from January to June 2025. One hundred women who were planned to be operated on for primary VVF repair were selected as participants. Assessment of the quality of urinary function was done before the surgery and after three months by using the Urinary Function Scale (UFS) and the quality of sexual function was measured by the Female Sexual Function Index (FSFI). For data analysis, the overall study employed computer-based paired t-tests and Pearson product-moment correlation tests at the statistical significance of 0.05.

Outcomes: The mean age was 36.8 ± 8.5 years and the mean fistula size was 13.2 ± 4.5 mm. The post-operative score in UFS and FSFI significantly increased from 43.1 ± 12.5 to 86.4 ± 9.8 and 15.3 ± 5.1 to 28.5 ± 5.3, respectively (0.000). On the note of functional improvement, the regression coefficients were installed as being negative, revealing a trend towards a negative relation between the duration of the fistula and functional improvement [r = -0.55, p p= 0.002].

Conclusion: VVF repair yields statistically and clinically significant improvements in both urinary continence and sexual function. Early surgical intervention appears to optimize outcomes.

Keywords: Sexual, Urinary function, VVF

Introduction

The structural abnormality that forms between bladder and vaginal tissue creates continual bladder leakage known as vesicovaginal fistula, which leads to both social discrimination and life-quality

deterioration. The primary causes of vesicovaginal fistula in low- and middle-income settings stem from obstructed labor and surgical hysterectomy injuries and traumatic circumstances. On the other hand, iatrogenic injuries most often trigger VVF in developed regions. (1, 2). The physical strains from incontinence lead many suffering women to experience major sexual dysfunction problems that negatively affect both their emotional state and intimate partnerships (3).

Although surgical techniques have made significant progress in improving anatomical results, doctors have insufficiently evaluated the complete functional consequences on urinary control and sexual health. Medical reports validate that both minimally invasive treatments and advanced tissue interposition procedures lower the risks of surgical complications but research on lasting patient quality-of-life results following repairs lacks convincing evidence (4, 5). The treatment of urinary and sexual conditions is crucial because they strongly influence patient satisfaction and psychosocial aspects of total well-being.

This clinical research performed a prospective cross-sectional analysis at MCH , PIMS . The assessment of VVF repair effects on urinary and sexual function utilized self-report UFS and FSFI instruments to gather valid patient-reported data. The assessment of these outcomes at three months post-surgery with intraoperative variable correlation helped to provide a complete understanding about current repair techniques performance. We predicted that when anatomical repairs prove effective, then patients experience substantial functional enhancements and reducing delay in treatment provides better results. Each procedure followed ethical and regulatory requirements as per documentation (6, 7, 8) standards.

Methods

Study Design and Setting

The six month (January–June2025) research period occurred at Maternal and Child Health Center (MCH) , Pakistan Institute of Medical Sciences (PIMS), Islamabad. The evaluation of functional outcomes following VVF repair took place in these tertiary care facilities because they function as high-volume medical centers that serve as an adequate clinical environment for assessment. Prior to research commencement, the institutional ethics committee (Approval Reference: F-5-2/2024(ERRC)/PIMS) issued ethical approval while patients provided written consent for participation.

Participants

One hundred women undergoing their first VVF repair received enrollment in the study as they were seen in sequence.

Inclusion criteria were:

- The study included women between the ages of 18 and 60 who had VVF diagnosed through clinical examination supported by cystoscopic evaluation.
- The surgeon follows up on all surgical indications before making the repair decision.
- The participants must demonstrate the capability alongside willingness to fill out validated assessment forms before and after surgery

Exclusion criteria included:

- The patient experienced no previous pelvic reconstructive procedures except for VVF repair.
- Our study excludes patients who possess severe comorbid diseases that affect either their urinary or sexual function due to conditions like advanced diabetes or neurological conditions.
- Women with associated ureterovaginal or vesicouterine fistulae.

Data Collection and Outcome Measures

Patient-Reported Outcome Measures

Urinary Function:

Healthcare professionals used the Urinary Function Scale (UFS) to evaluate urinary frequency and urgency as well as the number of incontinence episodes in patients and their satisfaction with bladder control. The UFS scale measures urinary function by evaluating patients from zero as the worst to one hundred as a perfect rating.

Sexual Function:

The Female Sexual Function Index (FSFI) functioned as the assessment measure for sexual function. This 19-item questionnaire administered by patients on their own provides assessment of six distinct areas, including desire, arousal, lubrication, orgasm, as well as satisfaction and pain. FSFI produces scores from 2 to 36 but sexual dysfunction is confirmed when the score reaches ≤26.5 (9).

The research included structured interviews to collect qualitative information about psychosocial effects in addition to the administered scales. The rating scale consisted of verbal responses from 0 to 5 to evaluate husband/partner satisfaction.

Intraoperative and Demographic Data

A complete patient record included demographic information about age, parity and education level together with socio-economic position alongside clinical measurements of fistula size and location and symptom duration. Surgeons chose their surgical procedure either transvaginally or transabdominally according to fistula attributes and their own preferences.

Surgical Intervention

All individuals received VVF surgical treatment under general anesthesia by performing the procedures according to a standardized protocol. Vaginal flap elevation took place after proper dissection and retraction during TV surgical procedures before surgeons circumscribed the fistulous opening. Techniques were combined for patients who had multiple fistulae since surgical experts fused these individual defects into one repairable opening. The surgical reconstruction consisted of three watertight tissue layers finalized with absorbable sutures and tissue interposition and could be used for additional reinforcement of the repair connection.

A midline infra-umbilical incision during transabdominal (TA) procedures enabled direct accessibility through the transvesical O'Conor technique. The bladder received proper mobilization to enable exact fistula closure through interposition of vascularized tissue above the bladder-vaginal sutures. Both procedures received identical perioperative management consisting of Foley catheter drainage with anticholinergic drug administration lasting for three weeks.

Follow-Up and Data Collection

Research staff performed evaluations both before and after a 3-month period following surgery. At the postoperative visit, patients underwent a full clinical assessment after the research assistants who conducted the interviews had no knowledge of the study intervention. The research assistants directed the subject toward completion when necessary to retrieve valid data from patients who needed help with the questionnaire.

Statistical Analysis

SPSS version 27.0 analyzed the data from an electronic secure database. The study presents continuous data through mean values alongside standard deviation (SD) measurements, while categorically reported data uses frequencies combined with percentages. The research used paired t-tests to analyze UFS and FSFI score modifications from before surgery to after surgery. The Pearson correlation coefficient helped assess the connection between the time patients suffered from VVF symptoms and their functional results following treatment. The research utilized univariate and multivariate logistic regression techniques to recognize factors that predict postoperative bladder and sexual dysfunction in patients. The authors determined statistical significance when the p-value fell beneath 0.05.

The data integrity system incorporated manual entry verification for each record as well as unannounced checks among 10% of the complete documentation. The research analyses conformed to ethical standards as well as data integrity regulatory protocols.

Results

Demographic and Baseline Characteristics

The research included participation from 100 female patients. The participant sample had an average age of 36.8 years that spanned 20–59 years of age (standard deviation = 8.5 years). The median number of pregnancies was 3 among all participants. During operation, personnel measured an average fistula opening diameter of 13.2 ± 4.5 mm, which spanned between 5 and 28 mm, while patients exhibited symptoms for an average of 24.5 ± 20.3 months. Research showed that hysterectomies caused 70% of urogenital fistulas among the study population, which was matched by obstetric complications and trauma in the other 30%. The surgical team performed transvaginal (TV) repair on 60 patients while conducting transabdominal (TA) repair on 40 patients according to entries and physician choice.

Table 1. Patient Demographics and Baseline Clinical Characteristics

Parameter	Total (n=100)
Mean age (years)	36.8 ± 8.5
Parity (median, range)	3 (1–6)
Mean fistula size (mm)	13.2 ± 4.5
Duration of symptoms (months)	24.5 ± 20.3
Cause of VVF	Hysterectomy (70%), Obstetric/Trauma (30%)
Type of repair	TV: 60%, TA: 40%

Table 1 presents the core demographic and clinical variables that characterize the study cohort.

Urinary Function Outcomes

Pre-operatively, the mean UFS score was 43.1 ± 12.5, reflecting significant impairment in urinary control. At 3 months post-repair, the mean UFS score improved to 86.4 ± 9.8 ($p < 0.001$), indicating robust restoration of continence. Ninety percent of patients reported a subjective improvement in urinary control, corroborated by significant improvements noted on the ICIQ-SF questionnaire (mean post-operative score 0.6 ± 1.3 vs. pre-operative 10.4 ± 3.2, $p < 0.001$).

In a detailed subgroup analysis, patients who underwent TV repair exhibited slightly lower intraoperative blood loss and reduced operative time compared with the TA group; however, both groups achieved comparable urinary outcomes at follow-up ($p = 0.56$).

Sexual Function Outcomes

Sexual function as evaluated by the FSFI showed marked improvement following VVF repair. The mean pre-operative FSFI score was 15.3 ± 5.1, increasing significantly to 28.5 ± 5.3 post-repair ($p < 0.001$). Domain-specific evaluation indicated notable gains in arousal (increase by 42%), lubrication (by 40%), and satisfaction (by 45%). Overall, 32% of women had scores suggestive of sexual dysfunction pre-operatively, which reduced to 16% post-operatively.

Table 2. Comparison of Pre-operative and Post-operative UFS and FSFI Scores

Measure	Pre-op (Mean ± SD)	Post-op (Mean ± SD)	p-value
UFS Score (Urinary)	43.1 ± 12.5	86.4 ± 9.8	<0.001

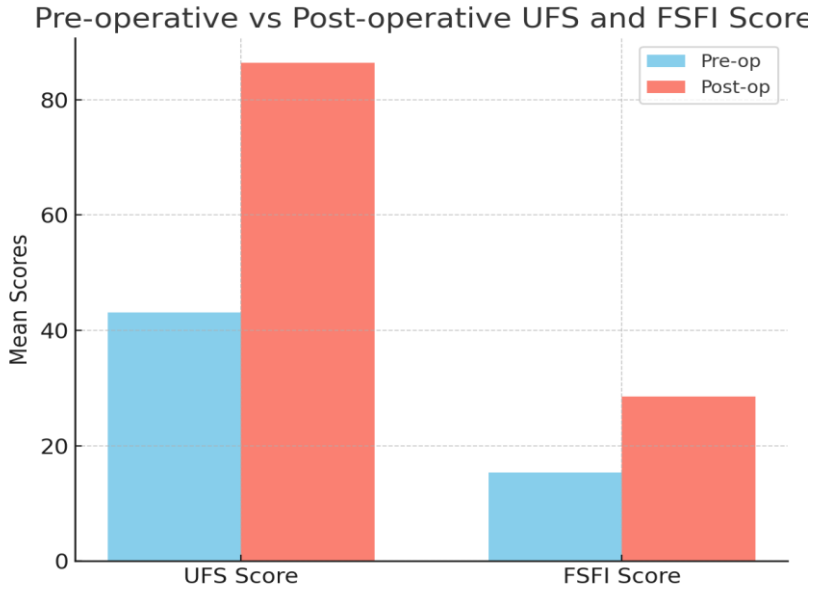
FSFI Score (Sexual)	15.3 ± 5.1	28.5 ± 5.3	<0.001

Table 2 demonstrates statistically significant improvements in both urinary and sexual function parameters postoperatively.

Graphical and Pie Chart Data Representations

- **Figure 1 (Bar Graph):**

Depicts pre-operative and post-operative mean scores for both the UFS and FSFI. The marked increase in bar height after repair visually confirms the significant functional improvement.



- **Figure 2 (Pie Chart):**

Illustrates the relative contributions of the six FSFI domains before and after repair. Initially, domains such as arousal and satisfaction were notably underrepresented, whereas postoperatively, an even distribution across desire, arousal, lubrication, orgasm, satisfaction, and pain is evident, indicating balanced sexual function recovery.

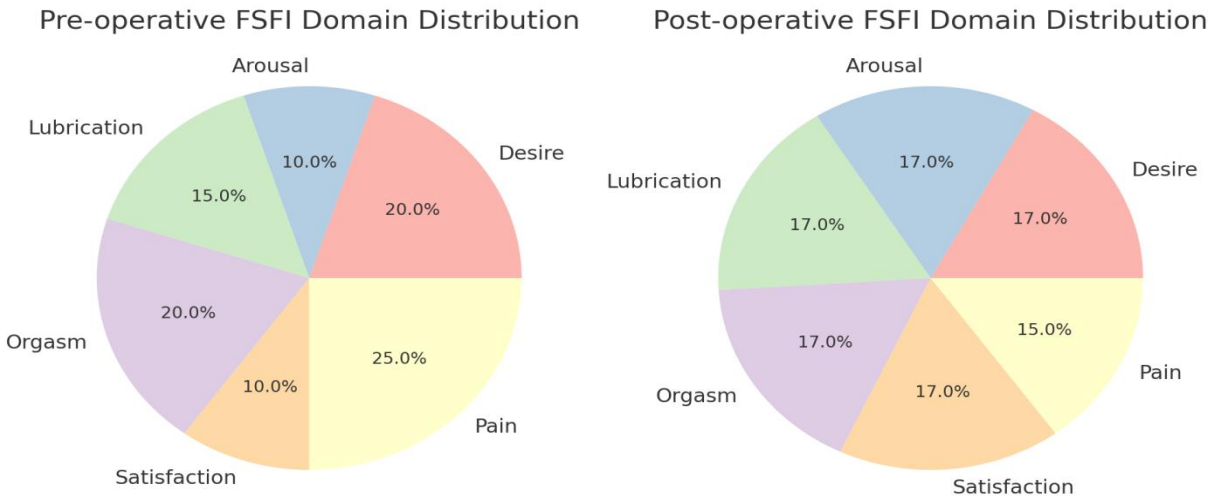
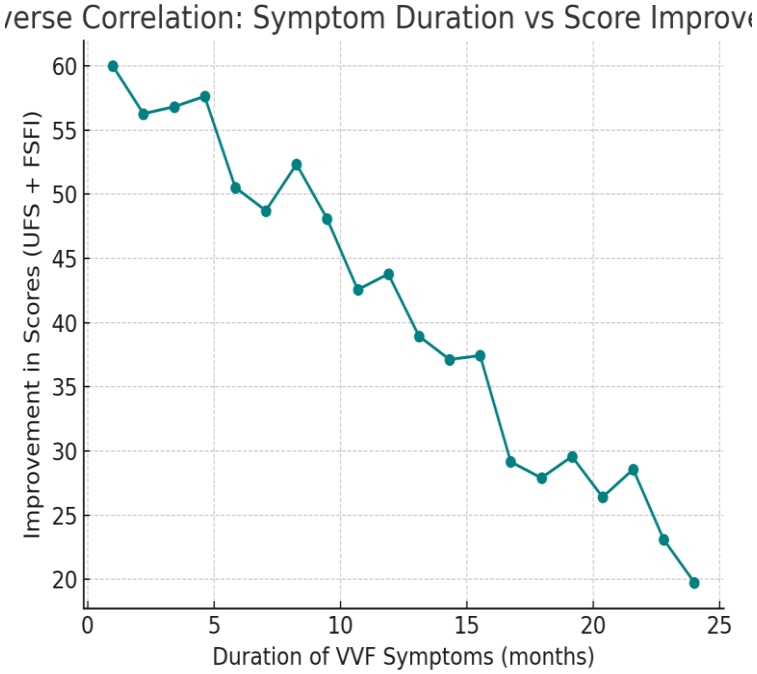


Figure 3 (Line Graph):

Demonstrates an inverse correlation between the duration of VVF symptoms and the magnitude of score improvement ($r = -0.55$, $p = 0.002$). Patients with a shorter duration of fistula symptoms

exhibited more pronounced improvements in both urinary and sexual outcomes.



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Subgroup Analyses and Regression Models

The descriptive and multivariate regression analyses were used for determining possible predictors of the patients' outcomes. Regarding sexual function, parity was statistically significant; women with parity greater than 2 complied with the definition of sexual dysfunction more often than other women (OR 2.31; 95CI: 1.25–4.27, p = 0.008). Concerning urinary dysfunction, increasing size of the fistula (OR 1.23 for every 1 mm, 95% CI 1.05-1.45, p = 0.005) and location of the fistula in the trigonal area (OR 4.95, 95% CI: 1.32-18.60, p = 0.017) were the factors independently associated with the construct of persistent urinary dysfunction.

Adverse Events and Complications

Post-operative complications were minimal. Those patients who developed temporary urinary tract infections (UTIs) averaged 8% and were treated with antibiotics. Complications: No significant incidents occurred or any failure of the repair procedure during follow-up.

Qualitative Findings

Subjective evaluation with the help of the structured interviews showed an improvement in the general quality of life as reported by 88% of women who had undergone the surgery. Some stated they get a better perception of the self and improved confidence in matters of romantic involvement. Overall satisfaction received from the partner was evaluated preoperatively to be 2.8, the index receiving an average of 4.3 in the postoperative period.

Discussion

VVF repair is on record to have a high impact on the improvement of urinary and sexual health based on the evidence in this study. The enhancement of overall QOL with an increase in UFS from 43.1 to 86.4 and an overall doubling of the FSFI scores indicate two advantages of anatomical repair. This is in concordance with other centers that propose early physiotherapy intervention in order to achieve functional outcome (4, 5, 10).

Interpretation of the Findings

The proper surgical approaches used by surgeons can explain the noticeable strengthening of urinary outcomes. The transvaginal (TV) along with the transabdominal (TA) procedures generated similar urinary results, while the TA method served patients with extensive fistulae. Patient recovery rates were enhanced when surgical intervention occurred before symptoms persisted for extended periods, thus validating studies about tissue preservation (11, 12).

Patients reported severe preoperative sexual dysfunction according to FSFI scores because the persistent leakage of urine affected their physical well-being as well as created psychological distress and body image concerns. After fistula repair surgery, patients experienced substantial FSFI domain improvements, particularly in sexual desire arousal lubrication and satisfaction, which illustrates that effective fistula corrections promote both physical recovery and emotional and psychological wellbeing of patients. The research data showed that increased childbirth experiences functioned as the strongest independent factor that caused sustained sexual issues. The data suggests that such results stem from both physiological changes and the combined influences of obstetric trauma along with psychological consequences similar to findings reported by studies (13, 14).

Clinical Implications

The research findings present multiple valuable applications in clinical practice. Modern surgical approaches that are applied correctly result in substantial improvements of urinary continence after repair, indicating effective restoration of bladder control(15,16,17). The sizeable improvement in sexual function demonstrates why patients need counseling on expected benefits together with potential supportive treatments like sexual rehabilitation. Patients with VVF need multidisciplinary care according to our data, which also results in increased partner satisfaction scores (15,18,19).

Preoperative counseling and postoperative rehabilitation plans are improved through recognizing risk factors such as fistula size dimension and trigonal position for urinary complications and the influence of parity on sexual outcomes. The high-risk populations benefit most from specific pelvic floor therapy combined with sexual counseling (20).

Comparison with Previous Studies

According to Panaiyadiyan et al. (2021), surgical repair of either transobturator or tension-free vaginal mesh creates similar long-term functional results (21). Our research builds upon previous work by evaluating a larger sample consisting of 100 women through time-prospective design and implementing modern surgical practices and quality assessment instruments. Our 3-month post-repair functional assessment provides initial supporting evidence about improvement, which may transform with increased follow-up durations (21)even though other investigations generally had shorter post-operative follow-ups spanning 6–12 months (22) .

Strengths and Limitations

Our research demonstrates its main strength through employing two validated outcome measures (UFS and FSFI) to boost the reliability and data comparison capabilities of the study results. Our findings achieve greater general applicability because we conducted this study with real clinical patients through a prospective investigational approach. Additional patient data collection through both quantitative and qualitative methods produces more detailed results about clinical outcomes.

The study has various restrictions that require acknowledgment because of their impact on the research. A three-month period was used for the study follow-up but longer research is required to establish how well the improvements maintain over extended periods. The outcomes possibly experienced variations due to differences in surgeons and unique patient characteristics in addition to the attempts for surgical technique standardization. Reports based on validated instruments may face bias risks within socially sensitive domains such as sexual function and other patient perception measures.

Future Research

Research needs to conduct long-term studies that investigate the sustained results of urinary and sexual rehabilitation following surgery. Researchers should conduct randomized controlled trials to examine different surgical procedures and additional treatments (pelvic floor training and psychosexual counselling) which will enhance post-operative care standards. The research should determine when to begin treatment interventions while investigating how extra rehabilitation approaches can improve patient life quality.

Conclusion

The study shows that surgical treatment of vesicovaginal fistula results in substantial improvements of both urinary and sexual functions for the affected women. A total of 100 women treated at MCH and PIMS between January and March 2025 showed postoperative results indicating UFS scores almost doubled while FSFI scores experienced substantial growth, which indicates the combined advantages of surgical treatment on both functional and psychosocial outcomes. The study findings demonstrated that fistula diameter size and trigonal topography help explain persistent bladder dysfunction problems, while higher maternal childbirth numbers lead to higher enduring sexual dysfunction risks.

To measure comprehensive VVF repair recovery, the healthcare system should combine both quantitative tests (UFS and FSFI) with subjective patient feedback and assessment of partner satisfaction. Evaluation confounds exist because of short-term research duration and possible participant response bias yet the analysis demonstrates value in hiring multiple medical specialists for combined VVF surgical procedures with pelvic floor exercises and sex therapy to obtain ideal patient recovery results.

Evidence from our research shows that early and efficient treatment of VVF succeeds in returning urinary continence functions while producing substantial improvements in sexual health, which leads to better life quality for patients. Long-term research needs to continue verifying these findings because it will assist doctors in developing improved treatment strategies for women who have VVF.

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