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Repair of Vesicovaginal Fistula: Experience in a Tertiary Care Center in Dhaka, Bangladesh

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Abstract **Original Research Article**

Background: Vesico-vaginal fistula (VVF) is a distressing condition with significant social and health consequences for women, particularly in developing countries. The study conducted at Dhaka Medical College Hospital, Bangladesh, aimed to analyze the characteristics, management, and outcomes of VVF repair in a tertiary care setting and to explore the factors contributing to the success rates of surgical interventions. ***Methodology:*** For the current study, a descriptive approach was employed, examining 72 vesicovaginal fistula repairs at Dhaka Medical College Hospital's Obstetrics and Gynaecology Department over a two-year period, from January 2007 to December 2008. The cohort consisted of patients with prior unsuccessful VVF repair attempts, deliberately excluding cases with additional complications such as rectovaginal fistulas or those who declined participation. Preoperative evaluations were systematically conducted, followed by surgical repairs under regional anesthesia, with general anesthesia reserved for specific indications. Surgical protocol dictated careful dissection and mobilization techniques, with intraoperative dye tests ensuring fistula closure integrity, and the use of labial or omental grafts as necessary. Postoperative care included absorbable sutures for vaginal closure, catheterization, and hemostatic vaginal packing. The postoperative regimen addressed potential complications and included detailed follow-up consultations, focusing on a range of urogenital and reproductive health indicators. ***Result:*** The majority of the patients fell within the age range of 31-35 years (25%), and 43.06% were primiparous. Preoperative complications included vaginal stenosis and urethral avulsion (18.06% each). Surgical repairs were mainly single-layer closures (90.28%), with a significant proportion utilizing labial fat grafts (38.89%). Post-operative complications were observed, with catheter blockage (33.33%) and urine leakage (30.56%) being the most common. Overall, 59.72% of the operations were deemed fully successful, with a notable percentage of patients experiencing persistent urethral incontinence (22.22%). ***Conclusion:*** The success of VVF repair in this cohort was consistent with other regional data, particularly highlighting the role of grafts in enhancing repair success. Despite the high success rate, the presence of post-operative complications necessitates improved postoperative care and the implementation of preventive strategies to reduce the incidence of VVF. The study underscores the importance of optimizing surgical techniques and patient management to improve VVF repair outcomes.

Keywords: Vesico-Vaginal, Fistula; Urethral, Genitourinary.

INTRODUCTION

Genitourinary fistula is a profoundly impactful condition that detrimentally affects women's physical and psychological well-being. While these fistulas have become rare in the industrialized world thanks to advanced obstetric care, they remain a persistent affliction for women in developing countries. For instance, a study by Hilton showed that almost 80% of fistulas are caused by obstructed labor, whereas in developed nations, they often result from surgical or radiation treatments for cancer [1].

The vesicovaginal fistula, which forms an abnormal connection between the urinary bladder and the vagina, leads to continuous and involuntary urinary incontinence [1]. The primary etiology of vesicovaginal fistulas is associated with difficult, unattended childbirths. A key factor contributing to the development of these fistulas is prolonged, obstructed, and neglected labor. Specifically, women with cephalopelvic

disproportion or fetal malpresentation experience prolonged obstructed labor, which ultimately may result in genitourinary fistula formation during the postpartum period. These fistulas often involve the bladder's trigone area, pinched between the presenting fetal part and the symphysis pubis [2].

Obstetric fistulas are frequently associated with several contributing elements: poverty, illiteracy, the diminished status of women, gender inequality, malnutrition, societal and cultural barriers to family planning, and a lack of emergency obstetric services [1]. Women suffering from obstructed labor and consequent fistula formation often remain childless, which significantly impacts their future. The absence of fistula repair and continued incontinence and childlessness may lead to these women being abandoned by their husbands, on whom they often depend economically. Consequently, fistula leaves women physically, emotionally, and socially devastated. Although genitourinary fistulas are not life-threatening, they lead to social debilitation.

Surgical intervention serves as the definitive solution for these fistulas, with the highest likelihood of success on the first surgical attempt. Surgeons with adequate training and expertise can enhance the surgical outcomes by tailoring their techniques to the fistula's specific location, size, and complexity [2]. Globally, the surgical repair of vesicovaginal fistula remains a significant challenge, with multiple acceptable techniques available, such as vaginal, abdominal, transvesical, or transperitoneal approaches. Gynecologists, often most adept with the vaginal route, typically prefer the transvaginal approach. This preference is attributed to its relative ease, safety, reduced bleeding, and shorter surgical time, as well as increased comfort for the patient [3]. In light of the advantages and disadvantages of the various techniques, the present study was conducted to observe the outcome of local repair of vesicovaginal fistula transvaginally.

METHODOLOGY

This descriptive cross-sectional study was conducted in the Department of Obstetrics and Gynaecology at Dhaka Medical College Hospital, Bangladesh, from January 2007 to December 2008. Out of 112 patients initially admitted for vesicovaginal fistula (VVF), a sample of 72 was finalized according to inclusion and exclusion criteria, including those who underwent vaginal route repair or primary repair, while excluding cases with concurrent rectovaginal fistula (RVF) or those managed abdominally. Upon agreeing to participate and understanding the study's aim, patients underwent detailed history taking, thorough examinations, and confirmatory assessments of fistulas using Sim's speculum to ascertain their number, size, location, and the condition of surrounding tissues. Cystoscopy and intravenous urography were employed as needed. Dye test and 3-swab test was employed for the assessment of the participants. Preoperative preparation included counseling and informed consent. Regional anesthesia was standard for surgeries, with general anesthesia administered when necessary. The operative technique involved careful vaginal inspection with a speculum, scar release if required, and identification of ureteric orifices for large or complex fistulas. Full-thickness incisions were made with precision to avoid bladder injury, and dye tests ensured leak-proof closures, supplemented by additional sutures as required. Labial or omental grafts were incorporated with appropriate anchoring techniques. Per-operative measures involved delayed absorbable sutures for vaginal closure, minimizing discomfort and eliminating the need for suture removal, followed by careful vaginal packing to reduce reactionary hemorrhage. Packs were removed or replaced mostly between 24-48 based on the surgeon's postoperative assessment. Discharge advice focused on self-care and the necessity of follow-up, where inquiries about continence, urogenital issues, infections, and menstrual patterns were made. Data was meticulously recorded on a predefined sheet and analyzed manually to ensure the integrity and coherence of the collected information.

RESULT

Table 1: Distribution of the patients by age. (n-72)

Age group	No	Percent
16-20years	9	12.50%
21-25 years	12	16.67%
26-30years	14	19.44%
31-35years	18	25.00%
36-40years	9	12.50%
41-45years	10	13.89%

In the study sample of 72 patients undergoing vesicovaginal fistula repair, the age distribution was skewed towards the 31-35 years age group, which constituted the largest proportion at 25.00%. The next highest prevalence was observed in the 26-30 years bracket at 19.44%, followed closely by the 21-25 years age group at 16.67%. Both the youngest (16-20 years) and the 36-40 years groups were represented equally, each comprising 12.50% of the cases. Patients aged 41-45 years accounted for 13.89%, indicating that vesicovaginal fistulas affect a broad age range, but with a higher concentration in the early thirties.

Table 2: Parity distribution of the patients: (n-72)

Para	No. of Patient	Percentage
1	31	43.06%
2	11	15.28%
3	7	9.72%
4	6	8.33%
≤5	17	23.61%

Within the cohort of 72 patients treated for vesicovaginal fistula, the distribution of parity reveals that the majority of patients were of low parity. Specifically, those with one childbirth (Para 1) comprised the largest segment at 43.06%. Women who had given birth twice (Para 2) made up 15.28%, while parity three (Para 3) and four (Para 4) had a smaller representation at 9.72% and 8.33%, respectively. Notably, there was a significant proportion, 23.61%, of patients with a parity of five or more, indicating that both lower and higher parity women are considerably affected by vesicovaginal fistulas.

Table 3: Preoperative complications among participants (n=72)

Parameters	Number of Patient	Percentage
Vaginal Stenosis	13	18.06%
Urethral Avulsion	13	18.06%
Associated Bladder Mucosa Prolapse	4	5.56%

The preoperative complication profile among the 72 participants in the study is characterized by a notable incidence of vaginal stenosis and urethral avulsion, each presenting in 18.06% of patients. Additionally, associated bladder mucosa prolapse was present in 5.56% of the patients.

Table 4: Per-operative variable distribution among the participants (n=72)

Parameters	Number of Patient	Percentage
Mobilization		
Not enough	4	5.56%
Satisfactory	46	63.89%
Excellent	22	30.56%
Fistula closure		
Single layer	65	90.28%
Double layer	7	9.72%
Graft given		
Labial fat graft	28	38.89%
Not given	43	59.72%
Peritoneal graft	1	1.39%
Per operative bleeding		
Average or minimum	66	91.67%
Needed blood transfusion	6	8.33%
Operation		
Very difficult	13	18.06%
Difficult	30	41.67%
Easy	29	40.28%

During the operative repair of vesicovaginal fistula among the 72 patients, the majority (63.89%) experienced satisfactory mobilization of the affected tissue, with an additional 30.56% described as having excellent mobilization, signifying effective preparation in most cases. Concerning fistula closure, the predominant method was a single layer closure, employed in 90.28% of cases, while a double layer approach was used in 9.72%. In terms of graft usage, a significant number of patients (38.89%) received a labial fat graft, whereas a peritoneal graft was seldom used, documented in only 1.39% of the cases. The majority of surgeries did not involve significant bleeding, with 91.67% of patients experiencing average or minimal bleeding and only a small fraction (8.33%) necessitating a blood transfusion. The difficulty level of the operations varied; however, a notable 40.28% of the procedures were classified as easy, suggesting manageable operative conditions, while 41.67% were difficult, and 18.06% were very difficult, highlighting the varying complexities encountered in these surgeries.

Table 5: Post-operative complication distribution among the participants (n=72)

Complications	Number of patients	Percentage
Catheter blockage	24	33.33%
Post-operative Urine leakage	22	30.56%
Fever	10	13.89%
Vaginal discharge	7	9.72%
Evidence of UTI by urine culture	9	12.50%

Post-operative complications following vesicovaginal fistula repair in the 72 participants revealed catheter blockage in a third of the patients (33.33%), suggesting this is a common issue post-surgery. Urine leakage persisted post-operatively in 30.56% of the cases, indicating that for a significant subset of patients, the initial repair did not achieve complete continence. Fever was noted in 13.89% of the patients, which could point to various post-surgical challenges including infection or inflammation. Vaginal discharge was reported in 9.72% of cases, and evidence of urinary tract infection (UTI), confirmed by urine culture, was present in 12.50% of patients, underscoring the necessity for careful post-operative monitoring and management of infections.

Table 6: Final outcome of operation: (n=72)

Outcome	Number of patients	Percentage
Fully cured	43	59.72%
Urethral incontinence	16	22.22%
Failed	13	18.06%

The final outcomes of vesicovaginal fistula repair operations among 72 patients show that 59.72% were fully cured, reflecting a positive result for the majority of the cases. However, urethral incontinence was reported in 22.22% of the patients, indicating a need for further medical attention or possibly additional surgical intervention for a significant minority. Additionally, a failure rate of 18.06% suggests challenges in achieving successful repairs in all cases, highlighting the complexity of the condition and potential areas for improvement in surgical techniques or patient selection.

DISCUSSION

During the study period, the prevalence of vesico-vaginal fistula in the VVF corner was reported to be 5.6%. This high prevalence is likely due to the increased number of cases referred from different districts of Bangladesh. Considering the age of the patients with fistula, Cowgill et al. in their study had shown that fistulas arising out of obstructed labor in underdeveloped countries were usually in younger age groups [4]. A recent study by Abdullah et al., showed that the majority of the patients belonged to the 16 to 20 years age group [5]. In contrast, in this study, the majority of the fistula patients were in the 31 to 35 years' age group (25.00%) followed by the 26 to 30 years age group (19.44%), indicating that as patients often live in remote areas, there is a delay in seeking treatment due to a lack of awareness about available medical services. A study done by Elkins et al. showed that primiparae are more vulnerable to develop fistula due to prolonged obstructed labor, which was similar to the findings of other studies [6-8]. The present study also showed that vesicovaginal fistula is most common in Primipara, present in 43.06% of cases. Additionally, this study showed that a significant portion of women were less than 20 years at the time of their marriage, which corresponds with the findings about VVF and parity in our country [5]. Successful repair of fistula depends on many factors. Patients presenting with vesicovaginal fistula may have other associated problems which complicate the fistula and interfere with successful repair. Even though rectovaginal fistula was excluded from this study, 18% of patients presented with associated vaginal stenosis, and 18% with urethral avulsion. 6% of patients had associated bladder mucosa prolapse & 4% had urethral avulsion with urethral stricture in 2% of patients. This associated pathology adversely affects successful repair, which is similar to the findings of Murad et al [9]. All patients in this study underwent local repair through a vaginal approach. The transvaginal approach seems to be faster, less morbid with relatively minimal blood loss and also has the advantage in terms of patient comfort. This approach is similar to the study by C.R. Majinge [10]. Among 72 patients, repair was completely successful in 59.72%, with partial success in 22.22% of patients. In the remaining 18.06% of patients, the condition did not improve. The success rate is comparable to that reported by the study of M H Khan et al. [11]. Analysis of perioperative and postoperative data with the outcome of the repair revealed causes of operation failure, which were mostly due to extensive scarring, large fistula size, impaired drainage of urine due to postoperative catheter problems, and infection. During the repair of fistula, labial fat grafts were used in 38.89% of patients and peritoneal graft in 1.39% of cases. Observational data suggest that grafts increased the success rate compared to direct fistula closures, by increasing the local blood supply of the repair area. The grafts were given to cover and seal off the repair, bring in new blood supply, and prevent cross union between bladder and vaginal mucosa. They also fill the dead space and elevate the urethra against the symphysis and function as a bolster in subsequent deliveries. These advantages have been shown to reduce the failure rate associated with attempted closure of complicated fistulae. In the present study, it has been proved that grafts increase the success rate, which is in concurrence with the studies by Boronow, by Smith, and associates, and C.R. Majinge who routinely used Martius Bulbo-cavernosus graft to reinforce the repair and reported a high success rate comparable to the results of the present study [10,12,13].

CONCLUSION

This study reveals the patterns and outcomes of vesico-vaginal fistula treatment in a tertiary care setting in Bangladesh, with the majority of cases being primiparous women aged between 31-35 years. The success rate of surgical repairs, particularly when utilizing grafts, aligns with regional studies, emphasizing the effectiveness of the vaginal approach. Complications such as catheter blockage and post-operative urine leakage highlight the importance of vigilant postoperative management. The data underscores the need for targeted strategies to prevent and treat VVF, improving the quality of life for affected women in Bangladesh.

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