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Comparative Analysis of Outcome Between Extravesical and Transvesical Repair for Vesicovaginal Fistula

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ABSTRACT

Objective: To compare the surgical outcome of extravesical and transvesical repair of Vesicovaginal fistula.
Study Design: Prospective comparative study.
Place and Duration of Study: Armed Forces Institute of Urology, Rawalpindi Pakistan, from Jul 2019 and Jul 2020.
Methodology: Forty-two patients with vesicovaginal fistula were included in the study. The causes of the development of vesicovaginal fistula were evaluated. Half of the patients underwent extravesical and remaining transvesical repair. The results were compared regarding operative time, mean blood loss, complications and recurrence.
Results: The vesicovaginal fistula was secondary to prolonged obstructed labour 27(66%), with an iatrogenic cause 15(34%). Mean operative time for extravesical repair was 83.00±20.00 minutes and for transvesical repair was 60.00±20.00 minutes. 71% patients undergoing extravesical repair experienced bladder spasms compared to 47% in the transvesical Group. Three cases suffered prolonged illeus in case of extravesical repair. The mean hospital stay for extravesical repair was 6.00±1.08 days, relatively more than transvesical, which was statistically significant (p-value <0.001)
Conclusion: Transabdominal approach for managing vesicovaginal fistula is the most preferred successful technique.

Keywords: Extravesical, Transvesical transperitoneal vesicovaginal fistula (VVF) repair, Vesicovaginal fistula.

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INTRODUCTION

Vesicovaginal fistula is an abnormal fistulous communication between the urinary bladder and vagina. This results in continuous urine leakage from the bladder into the vaginal vault, and the patient appears incontinent.[1,2] It may result in bad odour, excoriation of the vagina and a source of constant physical, mental and social embarrassment for the females. In Pakistan, 3500 cases of obstetric fistula occur everywhere . The overall incidence of VVF is 0.4-3.2%.[2,3]

Although VVF is the most common acquired fistula in the urinary tract, standard guidelines regarding the treatment strategy do not exist.[4] Conservative management, like prolonged bladder drainage and application of fibrin glue, has been used with variable success in some places.[5] The preferred treatment for VVF is surgery, with success rates ranging from 75 to 95%.[6] Multiple techniques like transvaginal, open transabdominal, laparoscopic and robotics exist.[7] Unfortunately, there is a paucity of local data regarding the surgical management of VVF.[8]

In our institute, complicated fistulas from all over Pakistan are referred to, and the preferred procedure is an open transabdominal approach. On the other hand, the laparoscopic approach is not preferred due to multiple surgeries and a lack of expertise. Open transabdominal surgery has two approaches, transvesical and extravesical repair, and they have never been compared previously. In this study, both approaches will be compared regarding operating time, complication and success rates.

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METHODOLOGY

This prospective comparative study was conducted at the Armed forces Institute of Urology between July 2019 and July 2020. Permission from Hospital Ethical committee (URO-Adm-Trg-1/IRB/2020/114) was taken, and written informed consent was obtained from every patient to be included in the study.

Inclusion Criteria: All patients with vesicovaginal fistula, irrespective of size or location, were included in the study.

Exclusion Criteria: Patients with infratrigonal and ureterovaginal fistula were excluded from the study.

A sample size of 42 patients was selected and divided into two equal groups by randomization. All baseline investigations were conducted, and a pre-anaesthesia assessment was performed before surgery. In addition, a CT urogram of every patient was done to rule out ureteric involvement.

All patients underwent cystoscopy, and the fistula was cannulated with a ureteric catheter so that it could easily be identified preoperatively. In cases where the ureter was very close to the fistula, a DJ stent was passed to avoid ureteric injury. The abdomen was opened via the Lower midline incison muscle layers divided. In the case of transperitoneal extravesical repair, the bladder was bisected, the incision was extended till the VVF location, and any adhesions were lysed. Ureteric stent inside the fistulous tract helped in the identification of VVf. The stent was after that removed, and the fistulous tract was dissected away from the bladder and vaginal wall. Dissection was continued 1cm distal to the fistula site so that adequate vaginal and bladder walls were available for closure. The vaginal wall was closed with 2 0 vicryl in the figure of eight patterns, and the bladder was closed with vicryl 3 0 in two layers. Omentum was interposed between the vaginal and bladder wall. In three cases, omentum was unavailable, so peritoneum and appendicitis eppiploice was utilized as interposition graft.

Whereas in the transvesical approach bladder was opened with the help of diathermy. The cystotomy fistulous tract was identified inside the bladder, and a ureteric catheter entered the fistula. The fistulous tract excised, and the bladder closed in two layers with Vicryl 3 0. In both procedures, if more than one fistula was identified preoperatively and was lying in close vicinity of the larger fistula, they were converted into one large fistula and closed by removing the intervening thinned-out bladder wall. The integrity of repair was checked by filling the bladder retrogradely with 300ml of normal saline, and any area of leakage was identified and repaired. Next, the bladder was drained with a 20 Fr suprapubic catheter and Foley catheter. Finally, the abdominal drain was placed.

Post-operative care of VVF repair patients is of utmost importance as mild negligence may result in fistula recurrence. The patient was nursed in a high-dependency unit, and strict vital signs monitoring and intake output charting were maintained. Broad-spectrum antibiotics were administered. Oral fluids were started on the first post-operative day after the return of bowel sounds. Abdominal drains were removed on the third post-operative day when the drainage was less than 50ml. SPC was clamped on the seventh post-operative day and removed on the 10th post-operative day. The urethral catheter was removed after 21 days.

Statistical Package for Social Sciences (SPSS) version 21.0 was used for the data analysis. The primary outcome was the recurrence of the fistula at three months follow-ups. Secondary outcomes were operative time, mean blood loss, analgesic requirements, hospital stay and complications. Quantitative variables were summarized as mean±SD and qualitative variables were summarized as frequency and percentages. An independent sample t-test was used for the comparison of variables. The *p*-value of ≤0.05 was set as the cut-off value for significance.

RESULTS

A total of 42 patients were included in the study. The mean age of the patient was 38.00±19.00 years. Among 42 patients, the majority 27(66%) of the patients developed VVF after prolonged labour and were referred from civil setups. Fifteen (34%) patients developed VVF post-hysterectomy. After the initial workup, 15 patients were found to have supratrigonal fistula and 27 trigonal fistulae. The infratrigonal fistula, mainly managed by vaginal repair, was not included in the study.

Approximately forty percent of the patients had previous attempts at repair. Amongst them, five patients had previous two attempts of repair at the tertiary care centres. The majority of the fistulas were greater than 2cm in size. Extravesical repair consumed more time because of the longer bladder incision, lysis of adhesions and omental interposition. However, surgery was performed by different surgeons, so there can be a bias in the measurement of time. Mean blood loss and analgesic requirements were more or less equal in both groups. The mean hospital stay for extravesical repair was 6.00±1.08 days, relatively more than transvesical, which was statistically significant (*p*-value <0.001). One patient developed prolonged ileus for four days, and a laparotomy was performed later.

This revealed intra-abdominal adhesions, which were broken and the patient had a smooth recovery. Many patients went into bladder spasms treated with anti-cholinergics, and the proportion was greater in the case of extravesical repair (15 Vs 10). Only one patient had clot retention during transvesical repair, which was managed by evacuation of the clot under seda-tion. Both groups of patients were followed for three months, and there was no fistula recurrence in all patients indicating successful repair. The comparison between the two groups has been summarized in the Table.

Table: Comparison of Transvesical and Extravesical Repair for Vesicovaginal Fistula (VVF) Repair (n=42)

	Transvesical Repair	Extravesical Repair	*p*-value
Age(years)	40.00±19.00	38.00±18.00	0.29
Size of Fistula(cm)	2.20+0.39	2.30+0.50	
Operative Time(miins)	70.00±20.00	83.00±30.00	0.10
Mean Blood Loss(ml)	60.00±09.00	62.00±11.00	0.69
Analgesic Requirement Diclofenac Sodium(mg)	280.00±30.00 mg	285.00±30.00 mg	0.70
Mean Hospital Stay	4.00±1.08 days	6.00±1.48 days	0.001
Complications			
Prolonged Illeus	Nil	3	0.1
Bladder Spasm	10	15	4
Clot Retention	Nil	1	0.08
Recurrence	Nil	Nil	0.59-

DISCUSSION

Vesicovaginal fistula is the most common form of urogenital fistulas. It results in persistent leakage of urine from the vaginal orifice causing a bad smell which results in social isolation of the patient.[9,10] The most common cause of VVF in the developing world is obstetrical injury due to prolonged labour or a caesarean section. The other causes are caesarean hysterectomy, hysterectomy for benign or malignant disease, malignancy or irradiation.[11]

Studies conducted in Pakistan revealed that 53.3 to 89.4 % cases of vesicovaginal fistula are due to prolonged labour.[2] In a recent study major etiological contributor to iatrogenic fistula was hysterectomy (52.5%), followed by caesarean hysterectomy (26.4%), and caesarean delivery (19.9%).[10] The same trend was found in our study, as most patients sustained VVF post-delivery. Only one patient developed VVF after radiotherapy for locally advanced CA endometrium. The age of the patient suffering from VVF varies. In our study, the range was 21 to 59 years. The previous study showed a range of 13-55 years in Sindh and 25-45 years in Lahore.[4]

Several approaches have been utilized to manage VVF conservatively with prolonged urethral drainage, Fibrin glue, transvaginal, transabdominal, laparoscopic and robotic techniques. The abdominal approach has been declared the most successful by many studies.[12-14]. In the 1950s, O Connor *et al.*[15] introduced the transvesical technique for VVF repair, which is still used in laparoscopy as a modified o conorr technique. This involves a small cystotomy of the bladder to identify the site of the fistula so that both ureteric orifices and fistula can be easily visualized, followed by excision of the tract and closure of the bladder and vagina through cystotomy. The extravesical approach is a more primitive technique focused on longitudinal cystotomy, dissection in the vesicovaginal plane reaching the fistula site and excision of the fistula tract. Very limited literature is available comparing both techniques, and none shows superiority over the other.[16,17] In our study, three patients undergoing extravesical repair suffered prolonged ileus, probably due to extensive bowel adhesions compared to none in the other group.

However, Miklos *et al.*[18] demonstrated no superior benefit of using omentum in VVF repairs. On the contrary, Luciano *et al.* considered it to be beneficial. A local study conducted at the Armed forces Institute of Urology concluded no added benefit of interposition flap in the management of VVF in O conner technique.[15]

Three patients undergoing extravesical repair suffered from prolonged illeus due to manipulation of the gut, and one had to undergo laparotomy for intestinal obstruction. Similar findings were depicted in studies conducted by Kapoor *et al.*[19]

The results of this study demonstrate a success rate of 100 percent with both techniques employed transabdominal. The high success rate was probably because of patient selection, all having supratrigonal and trigonal fistula. The infratrigonal fistula is operated by a gynaecologist in our setup by the transvaginal route. One patient with a ureterovaginal fistula was excluded from the study as she required ureteric reimplantation, which created a bias in the results.

CONCLUSION

The transabdominal approach for managing VVF is the most preferred successful technique. Extravesical transperitoneal or transvesical are less equivalent in results except for the duration of hospital stay, which was more in transvesical repair. The principles of an effective repair include adequate fistula exposure, tension-free bladder wall closure and prolonged bladder drainage.

Conflict of Interest: None.

Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

AA & KS: Study design, drafting the manuscript, data interpretation, critical review, approval of the final version to be published.

ZIM & HA: Concept, data acquisition, data analysis, drafting the manuscript, critical review, approval of the final version to be published.

ZT & NC: Critical review, drafting the manuscript, approval of the final version to be published.

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.

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