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Vesicovaginal fistula repair by vaginal route: A retrospective study at our tertiary care center.

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Abstract
Introduction : *A vesicovaginal fistula (VVF) this is a condition where in there is an abnormal communication between badder and the vagina[1] , this leads to significant morbidity in female urology. Immediate diagnosis and appropriate timely repair using appropriate procedure are essential for an successful management of these VVF cases[1]. Treatment for a VVF typically involves surgical repair to close the fistula and restore the normal separation between the bladder and vagina. The method of closure depends on surgeons and the main complication noted is recurrent fistula formation[2] .*
Material and Methods : *Retrospective study done in patients suffering with VVF which was conducted over a period of 24 months of follow up with these patients . The patients who are willing and able to comply with pre-post-operative and willing for vaginal route surgery are followed up and were recorded in this study . Post op catheterization was kept for more than a week then it was removed only after performing cystoscopy and follow up of the pts was done .*
Results : *12 patients were included in this study who were treated with vaginal route of repair at our centre .The mean age in this study was 52.5.The mean fistula size is 1cm . The most common etiology seen in gynecological surgeries is due to hysterectomy. Most common type of fistula seen in this study was juxta cervical 8 (66%).The primary successful repair rate of VVF was vaginal route was 91.6 % ,Post op complication was found in 3(25 %) who had urinary tract infection and 2(16.6%) had DM, pre op co morbidities potentially affecting wound healing and hospital stay was much shorter when compared with other repair The mean hospital stay was 44.5 .*
Conclusion: *Outcomes for a vaginal repair has given good results. Success depends on the excision of pathological tissue , closure of fistula and urine drainage via catheterization and most importantly it also depends on surgeons skills and experience .*
Keywords: VVF, Vaginal route , Catheterization .

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I. Introduction

A vesicovaginal fistula (VVF) is a medical condition that affects the female reproductive system and urinary tract. It is characterized by the presence of an abnormal connection or fistula between the bladder and the vagina.VVF is less commonly seen in developed countries from traumatic labour , in well resourced countries , most commonly fistulas are due to pelvic surgeries , radiotherapy or pelvic malignancy or due to any inflammatory cause like TB .[3]

Etiology : VVF is uncommon in developed countries. Common cause lies is after Surgery (i.e abdominal hysterectomy , gynecological ,urological , cancer surgery). VVFs can have a variety of causes some of the most common Obstetric causes in underdeveloped countries includes obstructed labour and also after following instrumentation , particularly in regions where access to proper obstetric care is limited . Other potential causes of VVFs include radiation therapy, chronic bladder infections, and certain medical conditions such as crohn's disease or tuberculosis.

Clinical Features :

- There might be an uncontrolled leakage of urine from the bladder into the vagina
- Causing symptoms such as incontinence, frequent or constant feelings of needing to urinate.
- A strong, persistent of odour urine and discomfort

This cause serious social problem and this condition significantly impacts patients quality of life and has shown lot of impact them psychologically and economically. The main gold standard treatment is Surgical repair .

Treatment for a VVF typically involves surgical repair to close the fistula and restore the normal separation between the bladder and vagina. The type of surgery used will depend on the location and size of the fistula, as well as the overall health of the patient. In some cases, reconstructive surgery may also be necessary to restore normal bladder function.It is important to seek medical attention if you suspect that you may have a VVF, as the condition can have serious health consequences if left untreated. In addition to the physical discomfort and inconvenience caused by incontinence, VVFs can also lead to recurrent urinary tract infections and damage to the bladder and kidneys. Early diagnosis and treatment can help prevent these complications and improve the chances of a successful outcome.

II. Material and Methods

Study design : This a retrospective study done at our centre, 12 patients who had VVF were and who all underwent Vaginal route surgery during a period of September 2020 to August 2022. All patients presented with complaints urinary leakage ,Regular interval of urination and odour.

Case Selection

Case selected were in age group between 45 y to 60 y female pt were included .Pre-operative work-ups such as detailing of medical and surgical history , physical examination, and pelvic examination : (i.e evaluating site,number,vaginal caliber, length ,mobility , status of margin ,scarring ,size) were noted . The external examination included : urinary meatus taken as a reference point for measuring the distance of the distal edge of the fistula .Laboratory tests included urinalysis, urine culture, renal function and coagulation studies**.** Imaging studies performed were computed tomography to know the actual extent of injury. Cystoscopy was done using a flexible scope with instillation of dye methylene blue to assess the size, number, location and proximity of the fistula from ureteric orifices and bladder neck. Three swab test was done to confirm .The patient who has a confirmed diagnosis of VVF, as determined by physical examination, imaging tests, and/or other diagnostic tests.Pt with co morbidities like DM were treated with insulin on Sliding scale once under control were taken for surgery and pt with anemia were evaluated were transfused and then taken for surgery .The patient is in generally good health and able to undergo surgery .The patient is willing and able to comply with pre- and post-operative instructions were included in this study.

The patients with previous history of urethral surgeries, patients with co morbidities like Hypertension , Immunocompromised state , pt on steroids , Advanced kidney disease were excluded .
-The patient is pregnant or planning to become pregnant in the near future.
-The patient having an active infection like Tb , Crohn's etc other condition that would make surgery risky.
-The patient who are unable or unwilling to comply with pre- and post-operative instructions .
-Post carcinoma status and post radiation
-Previously operated for fistula were excluded from this study .

Preoperative Assessment of Fistula

Assessment is done by evaluating the pelvis i.e noting the site, size, number, mobility and status of the margins , length of the fistula. Urethral involvement is assessed by a metal catheter through external urethral meatus into the bladder. CT urogram done will aid for the diagnosis of the tract .To know the exact the position of the ureteric openings in relation to a big fistula, cystoscopy is indicated. Complete hemogram , Renal function test estimation was done. Three Swab test also was done .

Usually most of the pts are from poor socioeconomic status and socially low need for improvement of the general condition is essential prior to surgery. Local infection of vulva to be treated by application of silicone barrier cream or glycerine. Urinary infection, if any, needs to be corrected before hand. If It was difficult to collect urine for culture and sensitivity. It is preferable to collect urine for the in situ catheter kept following the surgical repair. It is advised that to start urinary antiseptics precautionary at least 3–5 days prior to surgery.

Treatment

Vaginal route approach : Patient placed in a dorsal lithotomy position under general anesthesia. Cystoscopy was done before the procedure started in order to visualize the fistula and ureteric orifices. Retrograde placement of ureteric stent was done for the fistula close to the ureteral orifice. A self-retaining retractor was

placed inside the vagina to expose the fistula. Foley catheter was inserted into the fistula to get stability and traction during dissection of the tissue . An incision was taken onto the vaginal epithelium around the fistula. Until an healthy tissue was obtained vaginal epithelium was dissected of from the fibromuscularis layer. The fibrosed fistula edges were excised . Once the fistula was mobilized adequately , layered closure was to be performed. **First layer** is cosed with polygalactin 2-0 suture is preferred. Interrupted stitches excluding the bladder mucosa is done. **Second layer** is closure of muscle and fascial layer of the bladder wall with interrupted sutures using the same suture material and burying the first suture line. Apposition of the vaginal wall by interrupted sutures by same suture material, in a perpendicular fashion to avoid overlapping of suture lines. Closure must be water-tightened and is confirmed by dye into the bladder at the end of the operation. To maintain continuous bladder drainage by an indwelling catheter is inserted.

Post op care : Urinary antiseptics either given at appropriate to the sensitivity report. Nursing care for fluid balance, urine output and to detect any catheter block.Advice during discharge is
to pass urine more frequently to be counseled(i.e 1 hr) .To avoid intercourse for at least 3 months ,If repair fails, local repair needs to be attempted after 3 months [5]. The fistula may become smaller if the second attempt was successful.In cases of repeated failures, before declaring the case as irreparable, it is preferable to have a second opinion or to consult an urologic surgeon . This might avert the last resort to go for urinary diversion — implantation of ureters into the pelvic colon or ileal bladder preferred.[4]

Fig 1: Showing VVF

III. RESULTS

The data of the patients has been demonstrated in the TABLE 1 .. Patients who developed fistula from gynecological procedures were aged 40-60 years. 12 pts had VVF post hysterectomy procedure .All these patients underwent surgical repair via vaginal route. Stents were placed for few patients .All these cases were repaired Primarily .In clinical examination it was found that 8 pts had fistula at juxtacervical area, 4 pt had near midvaginal and 0 pts had juxtaurethral. Fistula size was noted around 0.5 -2 cm .The mean fistula size noted is 1cm The primary successful repair rate of VVF was via Vaginal route was 91.6 % , post op complication was found in 3(25 %) who had urinary tract infection and 2(16.6%).Post op Foleys catheterization was maintained for an average days 14.7 days .Cases were followed up regularly opd basis 15-30 days .Post op complications were noticed in few pts had UTI and USI and no other complications were noted .

TABLE 1 : Patient chart

Si No	Age	Medical cause	Surgical causes of VVF	VVF size ,distance to ureter & location	Post op follow up	Foleys catheterization post op	Complications	Hospital stay
1	45 y		AH	0.5 cm ,R ureter & Mid Vaginal	10	9d		30 d
2	56 y		LH	1 cm , L ureter &Juxtacervical	20	8 d		45 d
3	60 y	DM	AH	0.5 cm , L ureter &	25	10 d	UTI	90 d

				Juxtacervical				
4	48 y	Anemia	LH	1.5 cm , R ureter &Juxtacervical	12	15 d		30 d
5	50 y		AH	0.5 cm , L ureter & Mid vaginal	15	10 d		45 d
6	55 y	Anemia	LH	1.5 cm ,R ureter & Juxtacervical	10	28 d	USI	30 d
7	58 y		LH	1.5 cm ,R ureter & Juxta cervical	14	21 d		45 d
8	48 y	Myo	AH	1 cm , L ureter &Midvaginal	14	8 d		24 d
9	56 y	Anemia	LH	2 cm, R ureter & Juxta cervical	20	40 d		45 d
10	49 y		LH	1 cm , L ureter & Mid vaginal	10	9 d		30 d
11	56 y	DM	AH	0.5 cm , R ureter & Juxta cervical	14	10 d	UTI	90 d
12	50 y	Anemia	LH	0.5 cm , L ureter & Juxtacervical	18	9 d		30 d

Myo= Myomectomy ,LH =laproscopic hystrectomy , AH = abdominal Hystrectomy , UTI=Urinary Tract infection , L = left , R = Right ,DM = Diabetic Mellitus , d= Days ,USI =urinary stressincontinence

TABLE 2 : Demographic data of the pt

AGE	**NO of cases**
Mean Age	52.5
Average	45-60

TABLE 3 : Risk factors and site of VVF

Pelvic surgeries	
- Abdominal Hysterectomy	7 (53.5 %)
- Lap Hysterectomy	5 (41.6 %)
VVF	
Mean size of VVF	1 cm
Juxta cervical	8 (66 %)
Midvaginal	4 (33%)

TABLE 4 : Associated medical condition

Medical Condition	
DM	2(16.6 %)
Anemia	4 (33 %)

TABLE 5 : Post op details

POST OP follow up	15.1
Mean average Foleys maintained	14.7
Complications	
Ureter injury	-
Urinary stress incontinence	1(8.3 %)
Urinary tract infection	2 (16.6 %)
Mean Hospital stay	44.5

IV. Discussion

Our study is a retrospectively conducted in 12 pts who were suffering from VVF , these pts were followed up for a period of 24 months in our department of of urology Al Ameen Medical College from period of Sept 2020 to August 2022. Table 1 and 2 showing demographic data of the pt . The mean age in our study is 52.5 which is compared with T.S. lo et al similar to there study with average age raging from 45-60 y was observed in this study[4] .VVF repair depends on the factors such as distance from ureteric orifices, pts condition ,

accessibility to vagina and the type of fistula .Most obstetric cause of VVF tend to be low-lying located near the bladder base, trigone, and urethra, since it results from impacted head and/or instrumental delivery during delivery. Whereas, gynecologic causes of VVF are high-lying resulting from hysterectomies and tend to be simple, single in number, located farther from the ureteric orifice easy access through the vagina.

Most surgeons would prefer to repair the VVF when there is no active inflammation, infection, and necrosis. The repair is performed at 12 weeks duration after the diagnosis.[1]. Urogenital fistula has remained a hidden condition, because it affects some of the most marginalized members of the population—poor, young, often illiterate girls and women in remote regions of the world. In the developed countries,with the advent of widespread emergency obstetric care, urogenital fistulas are rarely seen.[6] In our study VVF caused by hysterectomy or gynecological procedures are mainly included which is similar to the study done by Kochakarn and associated found that more than 70 % were caused by hysterectomy[7] .In our study 7 (58.3 %) pt had undergone lap hysterectomy and 5(41.6%) had undergone abdominal hystectomy as shown in table 3 which is similar to study by Harkki et al it is seen that laparoscopic hysterectomy has a higher incidence of urological injury than open surgery[8] . Statistics in India, where 83% to 93% of fistulae are caused by obstructed or prolonged labour[9]. In our study the most common site of fistula involved was at juxtacervical 8 (66%) and midvaginal 4 (33%). In this study pts affected with medical condition like diabetic mellitus 2 (16.6%) it is shown in a study by Amy Y Li et al that assessed comorbidities were limited to factors thought to impact post-operative wound healing such as diabetes mellitus and Anemia 4(33%)[10] .VVF is associated with urogenital infections and ammonia dermatitis, and the psychosocial ramifications may be devastating, as women may be socially isolated from their families and community[11]. In this study the preferred surgical approach was vaginal route because of there is decreased requirement of analgesics, cosmetically better ,reducing post op morbidity, shorter hospital stay, relatively lower costs and does not require sophisticated or expensive material, dedicated OTs , shorter use of foleys catherisation It was seen that that the bladder should be continuously drained after surgical repair of fistula. Longer duration of bladder catheterization increases the risk of urinary tract infections and other associated morbidities. In our study which resulted to a minimum of 8 days and maximum of 40 days prior to removal cystoscopy was performed to confirm . In table 5 it shows that mean days of foleys catherization was done for 14 days in our study and foleys catheter is removed once cystoscopy shows good tissue integrity and similarly it is shown in study by Tsia Shu Lo et al[4]. In our study the success rate was 91.6% where in a study by H. Frohmüller and associates they had a success rate of VVF 92 %[12] and when compared to other studies they showed 18.8 % failure main complications noted in our study is noted is USI and UTI . Factors that contribute to failure as told in the study by Frajzyngier et al[13] is due to age parity surgical approach , small bladder with urethral destruction , severe vaginal scarring and fibrosis in the epithelium in them prognosis will be poor .In our study the mean hospital stay noted was 44.5.

V. Conclusion :

Outcomes for a vaginal repair has given good results and is cosmetically better . Success depends on the excision of pathological tissue , closure of fistula , urine drainage and most importantly it also depends on surgeons skills and experience .

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