Surgical Management of Simple Vesicovaginal Fistulae

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Objective: Vesicovaginal fistula is a fairly common occurrence in our country because of poor availability of obstetric care. The purpose of this study is to review our results in the surgical management of VVF.**Design:** Prospective study.
Place and duration of the study: The study was conducted in the department of urology, Federal Government Services Hospital (F.G.S.H.); Islamabad, from February 2002 to January 2004. **Patients and Methods:** Eleven patients were operated for vesicovaginal fistulae. Transvaginal repair was done in 8 (72.7%) patients while transabdominal repair was adopted in 3 (27.3%) patients only. **Inclusion criteria:** All patients presented with vesicovaginal fistulae only. **Exclusion criteria:** All patients presented with genitourinary fistulae other than VVFs. **Results:** The majority of fistulae (10 (90.9%)) were caused by ischaemic necrosis of bladder and vaginal walls resulting from obstructed labour. One (9.1%) patient developed VVF after hysterectomy due to some gynaecological problem. Surgical repair proved to be successful through transabdominal route in all 3 (100%) cases of VVFs while in 6 (75%) of 8 (100%) cases through transvaginal route. To describe an overall result, 9 (81.8%) vesicovaginal fistulae were successfully repaired at first attempt. **Conclusion:** Vesicovaginal fistulae can be best managed following basic surgical principles like adequate exposure, identification of structures, wide mobilization, tension free closure, good haemostasis and uninterrupted bladder drainage.
Key words: Vesicovaginal fistula, Obstetrical trauma, Urinary incontinence, Urinary fistula, Gynaecological trauma.

Vesicovaginal fistula (VVF) is an abnormal connection established between the bladder and the vagina that allows the continuous involuntary discharge of urine into the vagina. VVF is the most common subtype of urogenital fistulas. It is one of the most feared complications of female pelvic tract. Descriptions of urinary fistula have been well described as early as ancient times by Hippocrates and Rufus, but still it is a common problem in developing countries. VVFs were once equally common among both developed and developing nations. Obstetric trauma was the major causative factor. But in the modern era VVFs secondary to obstetrical cause is a rare consequence in the developed world 5 - 8%[1,2] while in contrast it is still the commonest cause 84 – 97%[3,4] and a great challenge for the women in the developing countries.

Pakistan is a developing country and it is true in this country too, especially in rural areas. Most of our population, 70-80% lives in villages [5]. Due to the lack of availability of health care facilities, especially the maternal health care, there is no concept of antenatal care and hospitalization. Childbirth is usually (75-85%) conducted by unskilled traditional birth attendants (TBA) such as "daai's" and "ayah's"[6]. This situation is even worse in remote smaller villages. The lack of skilled obstetrical care, inadequate transport system, late referrals and arrivals in hospital, all eventually leads to an obstructed labour lasting 2-3 days, resulting in dead fetus and severe pressure necrosis to the bladder base, ultimately ending up into fistula formation[7]. We report our experience with the treatment of vesicovaginal fistulae in the last two years. Our objective is to highlight the commonest cause of VVF and to share our experience in their surgical management.

History of the Procedure:
The term fistula (previously called ruptura) was not used until 1597, when Luiz de Mercado first coined the term. Hedrik von Roonhuyse in 1663 described the first basic surgical principles for the repair of VVF. Johann Fatio documented the first successful repair of VVF in 1675. In 1834, Jobert de Lamballe published a report of his VVF repairs in which skin flaps were used in the vagina. In 1838, John Peter Mettauer had done successful repair of VVF using silver wire. James Marion Sims published his famous discourse on the treatment of VVF in 1852. He achieved his first success in the repair of VVF on a negro slave Anarcha, in June 1849 on his 30th surgical attempt, using silver wire as a suture material. Sims described a reproducible surgical approach using 3 surgical principles of the fistula repair as;- 1) excise all scar tissue 2) obtain fresh margins and 3) close the tract without overlapping suture lines.

In 1861, Maurice Collis was the first to report a layered closure technique. In 1950, O'Conor and Stovsky popularized the transabdominal approach and also proposed the use of electrocoagulation as an initial treatment modality in women with VVFs of 3.5 mm or less, citing a 73% success rate. Numerous surgeons are named for the development of various flaps for interposition between the bladder and vaginal walls to minimize the failure of VVF repairs. Some of them are; Garlock in 1928 (pedicled gracilis muscle flap), Martius in 1928 (pedicled bulbocavernosus flap), Kiricuta and Goldstein in 1972 (pedicled omental flaps).
Despite all these advances, VVF repair still remains technically challenging. Smith and William estimate that there are 500,000 cases of untreated VVFs, worldwide.

Patients and Methods:

This study has been conducted in the department of urology, Federal Government Services Hospital; Islamabad, in 2 years i-e from February 2002 to January 2004. Patients were first seen in urology OPD. Total number of patients operated upon was 11. Data was collected prospectively. Diagnosis about urinary fistulae was made in OPD after a detailed history, general & systemic physical examination and some basic investigations. In this study we only included VVFs. Patients were informed about the disease and its management alongwith postoperative consequences, in detail and were admitted in urology ward after counseling & consent.

Investigations: These are divided in to routine (for anaesthesia fitness & to rule out any associated comorbid) and specific investigations (as a part of diagnosis). IVU was done in all cases, as a basic investigation for urinary fistulae. For further conformation of the diagnosis, all patients were taken to the Operation Theater where EUA, Cystoscopy and Vaginoscopy were performed in all cases. Blue dye test or double dye test was performed if necessary. Retrograde ureteric studies or ureteropyelography was done in doubtful cases of ureteric involvement on IVU. Decision about the route of surgery was taken after these specific investigations and patients were prepared for the surgery on the next coming list. The basic decision making key points leading to success, about the fistula before surgery are to recognize the type, site, size, number, relation with ureteric orifices, local condition or quality of tissue available, and or other multiple organ involvement.

Techniques of repair: The best approach is the one that offers the greatest chance of cure with the least morbidity. The best chance for a surgeon to achieve successful repair is by using the type of surgery with which he or she is most familiar. The first attempt of closure is the best chance of success.

Techniques of repair include (1) the vaginal repair (2) the abdominal repair (3) electrocautery (4) the laparoscopic repair (5) using interposition grafts or flaps e.g. labial fat, gracilis muscle, peritoneum, omentum or bladder mucosa (6) fibrin glue (7) electrocautery and endoscopic closure using fibrin glue and bovine collagen.

Vaginal approach: Patient is placed in lithotomy position. Exposure and access to a VVF is facilitated by catheterization of the fistula with a balloon catheter (Foley catheter). Bulb / balloon of the catheter is inflated, then traction is placed on the catheter to draw the VVF into the operative field. In this technique, the vaginal wall is incised circumferentially around the fistula and a plan between the vaginal wall and fistulous tract is created to allow for tension free closure. The margins of the fistulous tract are closed interruptedly with vicryl 2/0 in a longitudinal direction. The surgery is completed with the vaginal wall closure over the bladder defect in a transverse fashion, interruptedly with vicryl 2/0. At the end of the procedure Foley's catheter is inserted through the urethra for continuous bladder drainage.

Abdominal approach: After giving the lower midline abdominal incision, bladder is mobilized. The posterior wall of the bladder is dissected free as much as possible. The bladder then is bivalved at the dome. This incision is extended posteriorly to the level of the fistula. Fistulous tract is excised and bladder wall is further separated from the underlying endopelvic fascia and vaginal wall by fine dissection, to get adequate mobilizations for tension free suturing. The vaginal wall is just approximated in a transverse direction with 2/0 vicryl interruptedly but the bladder is sutured with 2/0 vicryl continuously, water tight and in a longitudinal direction to avoid superimposing of the suture lines of the vagina and bladder. Bladder is usually closed in 2 layers. 16 Fr Foley catheter is passed only transurethrally for drainage of urinary bladder. A retropubic drain is placed in dependent area and abdominal cavity is closed after securing good haemostasis. A loose pyodine soaked pad is placed inside the vagina for 24 hours.

Postoperatively patients are nursed in lateral or semi prone position, to avoid the stasis of urine over the suture line. Antibiotics are given for one week and analgesics as required. The appropriate antispasmodics are used to prevent the bladder spasms and damage to the repair site. The drain is usually removed after 5–7 days while urethral catheter after 10–14 days.

Where necessary, ureteral orifices are identified and catheterized. Commonly, peritoneal or interposition grafts are added by some surgeons especially in complicated cases while others believe in dual catheter (transurethral and suprapubic) drainage of the bladder. But we did not needed such procedures in any case.

Postoperative precautions: Postoperatively when the patient is discharged from the hospital, following precautions are advised.

Avoid any pelvic and speculum vaginal examinations during the first 6-8 weeks because the tissue is delicate and it may result in traumatic damage.

Avoid sexual intercourse for 3 months.

Results:

Out of these 11 patients presented to us with urinary incontinence, majority (81.81%) was in the age group of 20-35 (table 1). All patients were in fertile state except one that was already operated for hysterectomy due to gynaecological problem at the age of 45 years.

Table:– 1 Age group of patients

Age (yrs)	n=	%age
20-25	2	18.18
26-30	3	27.27
31-35	4	36.36
36-40	1	9.09
41-45	1	9.09
Total	11	100

The commonest causative factor (90.9%) found to be the obstetrical trauma (Table 2). It was mainly due to prolonged obstructed labour. Only one (9.09%) patient was presented with fistula due to gynaecological surgery at some periphery. No patient with fistula due to malignancy or radiation was presented to us during this study.

Table:– 2 Causative factors (n=11)

Causative Factor	n=	%age
Obstetrical trauma		
Obstructed labour (O/L)	06	54.54
O/L + C/S	02	18.18
O/L + C/H (due to ruptured uterus)	01	9.09
D & C	01	9.09
Gynaecological trauma		
Fibroid hysterotomy	01	9.09

O/L= obstructed Labour; C/S = Caesarian Section; C/H = Caesarian Hysterectomy; D & C = Dilatation and Curettage.

Of these 11 patients, previous surgery for fistula repair was already attempted in 3 cases at some periphery (table 3). Out of these 3 patients 2 were repaired successfully but one case failed to heal properly. It was a large fistula. On the other hand, from 8 cases that were directly referred to us without any surgical attempt for repair, 7 were repaired successfully. Among these patients only one failed. It was a large fistula that could not repaired successfully through vaginal route. Postoperatively a small residual fistulous opening was left.

Table 3 Previous repair before reaching FGSH Islamabad (n=11)

Previous repairs	n=	Success	Failure
No attempt	8(72.72%)	07	01
1 attempt	2(18.18%)	01	01
Multiple attempts	1(9.09%)	01	Nil

Table:- 4 Route of repair

Procedure	n=.	Successful repair	Failed repair
Transabdominal repair	3 (27.27%)	3	0
Transvaginal repair	8 (72.72%)	6	2
Total	11 (100%)	9 (81.8%)	2 (18.18%)

Transabdominal repair was done in 3 cases and all were successfully healed. On the other hand transvaginal repair was performed in 8 cases, 6 healed successfully but two failed. In one patient fistula was of large size and postoperatively only a small residual hole was left. The other patient was already operated at some periphery and there was lot of adhesions and scarred tissue that resulted in failure to our repair too.

Discussion:

In developed world like Europe and United States the primary etiology of vesicovaginal fistulae is related to inadvertent gynaecological surgery (85%)[1] especially hysterectomy (73 - 91%)[8,9] whereas obstructed labour is the rare or least common (5-8%)[1,2] cause. It is all due to availability of good maternal care and easy access to caesarian section in case of obstructed or difficult labour in these zones. The reverse is seen in developing world. In underdeveloped countries like India, Pakistan or Nigeria the commonest cause of VVF is obstetrical trauma in 84-97% of cases[3,4]. The patients in these countries are unable, when necessary to access the appropriate hospital care with facilities for operative delivery. Poverty with its many ramifications i-e inability to pay for transport & hospital fees and lack of education, is a major underlying factor. Our study revealed that 90.9% of the vesicovaginal fistulae were due to obstetrical trauma. It is similar to the studies done in the other developing countries.

The success rate of fistula repair in our study is 81.8%. The success rates reported earlier of similar studies done in Pakistan ranges from 62.5 - 90%[7,10]. Many other studies have reported even higher success rate ranging upto 100% with transabdominal[2,11] and transvaginal repair. This reflects that the better results can be achieved by the proper preoperative evaluation of the fistula and following the basic surgical principles like absence of local infection & induration at the moment of surgery, adequate exposure, use of healthy or well vascularized tissues for repair, closure in perpendicular tissue layers to avoid superimposing of suture lines, watertight & tension free suturing of bladder and adequate postoperative urinary bladder drainage.

Pakistan is an underdeveloped country. Intranatal as well as antenatal care is still not readily available in most of its remote settings particularly in smaller villages. Home deliveries (childbirth) ranges from 61-89%. Poor and illiterate people firstly are unable to afford the hospital delivery and secondly they are even not well aware of the importance of maternal care. Our study highlights the need to improve our maternal & child health care system. It also stresses on the need of health education to prevent these devastating obstetrical complications and to save the mothers from the miseries of VVF.

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