

## A Tertiary Care Experience of Vesicovaginal and Uretero Vaginal Fistula Repair: Factors Predicting Success

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### Abstract:

**Objective:** To analyze the patterns of presentation and management of genitourinary fistulas due to obstetrics and gynecology complications at a tertiary referral center.

**Material and methods:** We conducted this retrospective study analyzing —patients with genitourinary fistulas after obstetric and gynecologic surgeries between January 2014 to December 2022. We recorded the patient's characteristics and then analyzed the etiology, surgical management and success rates, and the primary end point of success being leak free patient.

**Results:** The distribution of genitourinary fistulas in descending order was vesicovaginal - 64.17% and ureterovaginal -35.80%. The mean time to presentation was 177 days with a wide range of 20 days to 300 days. The most common etiology was abdominal hysterectomy (67.1%) followed by obstetric causes (14.9%). For vesicovaginal fistulas the route to be used for repair depended on surgeon's preference and transabdominal route was successful in 95.4%.

**Conclusion:** Genitourinary fistula is a socially debilitating problem.

First attempt being the best is mandatory for successful repair. Modifying techniques according to site, size of fistulas is the key to success.

**Keywords:** Vesicovaginal Fistula, VVF, Ureterovaginal Fistula, Ileal Augmentation, Bladder Autorotation Flap, Tertiary Care, Prevalence.

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### Introduction

Injuries of the urinary tract have always been a shortcoming of gynecologic and obstetric surgeries due to their close proximity to one another. Injuries involving the urinary bladder and the ureter are most common and injuries to the urethra occur less frequently. The incidence of these fistulas has been reported to be between 0.2-2% in developing world [1].

Vesico vaginal fistula (VVF) and Ureterovaginal fistulas (UVF) are common occurrences in developed countries also with an annual incidence of 50,000–100,000 cases and more than 2 million women affected worldwide. While obstructed or prolonged labour continues to be the leading cause in developing countries, iatrogenic injury during obstetric or gynaecologic surgery such as Caesarean section or hysterectomy is the most common cause in the industrialized world [2].

VVF is a debilitating condition that leads to persistent foul odour with urinary discharge leading to excoriation of vulva and vagina. In a developing

country like India, where strong religious and cultural beliefs are present, this causes a lot of social taboos leading to social isolation and physical and emotional distress to the patients.

A large number of unidentified patients with genitourinary fistulas still exist who do not turn up for treatment due to socioeconomic reasons. Ours, is a tertiary referral center in southern India, which provides healthcare services to a vast population, so we conducted this study to see the patterns of presentation and management of these injuries.

### Material & Methods

In this study, we reviewed our prospectively maintained database for those patients who presented to us with urologic complications of gynecologic or obstetric surgeries performed from January 2014 to December 2022.

**Inclusion criteria:** Vesico-vaginal and uretero-vaginal fistula

**Exclusion criteria:** other uro gynecological fistula

There were 67 cases with injuries to ureter or bladder. The demographic characteristics of the patients were recorded. The etiology and presentation of these genitourinary fistulas along with the interval between the inciting surgery/procedure and their presentation to us were recorded.

Office based -local examination, methylene blue test and three swab test were done. Upper urinary tracts of all cases were evaluated by an ultrasound and CECT KUB. Computed tomography (CT) urography was done in all cases of UVF and VVF as institutional protocol. All vesicovaginal (VVF) and ureterovaginal fistulas (UVF) were confirmed by cystoscopy, and vaginoscopy. Definitive management of genitourinary fistulas, especially VVF, was carried out after 2-3 months of primary surgery and ureterovaginal fistulas without any time delay.

The management of VVFs was achieved with transabdominal, or laparoscopic repair. 5F ureteral stent was placed in cases where the fistula was close to ureteric orifices. For transabdominal repair of a VVF, we use the Modified O'Connor's Technique. We keep in situ both urethral as well as suprapubic catheters for 4-6 weeks.

Anticholinergics are routinely prescribed to all patients. Augmentation with an ileal segment was done in patients with diminished bladder capacity. Ureteroneocystostomy for ureterovaginal fistulas was done through extravesical route, using open approach. In cases where the injury was high up in the ureter a Boari's flap was made. In some cases, a psoas hitch was enough. We do not routinely perform a cystoscopic examination before catheter removal. The primary end point for success rate was patient being leak free. The follow-up period of these patients was estimated as the time elapsed from catheter removal up to their last visit.

### Results

67 patients with VVF and UVF were operated in a period of 8 years. All patients with VVF were from a rural background and about 40% of UVF patients live in urban area.

41 of the patients had VVF and 24 had UVF and 2 patients had both UVF and VVF. Gynecologic cause accounted for 79.1% of fistulas.

Other results are summarized in Tables below for additional demographic, operative, post-operative analysis for associations with VVF failure.

**Table 1:**

<b>Mean Age (yrs)</b>	<b>41.1</b>
Fistula size (mean)	1.08 cm
Previous fistula repair	4
Location of fistula	Supratrigonal – 40 Trigonal - 1 Subtrigonal – 2
Time with fistula prior to repair (Mean)	5.9 months (177days)
Ureteric stent placed	26 UVF & 6 VVF
Pre op Comorbidities	HTN – 14 HTH -8 DM - 6 CAD - 1
Etiology of fistula	Gynecological causes – 53 Obstetric causes – 10
Postoperative Complications	Recurrence – 2 cases Retained DJS – 1 Dyspareunia – 0 Post op OAB - 0

**Table 2:**

Previous surgery		
Obstetric causes	10	14.9%
• Obstructed labour	2	
• LSCS	6	
• LSCS with Hysterectomy	2	
Gynecologic causes	53	79.1%
• TAH	45	
• Vaginal Hysterectomy	8	
Recurrent VVF	4	6.34%

**Table 3:**

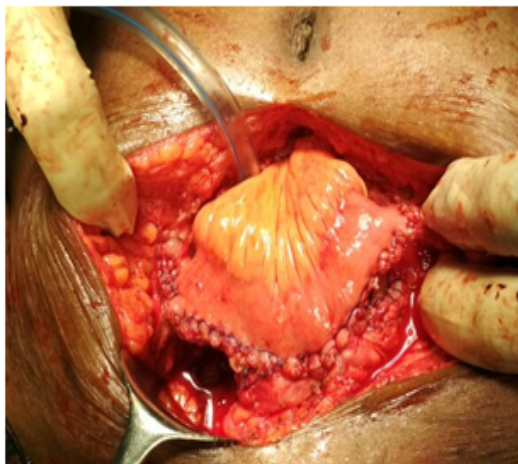
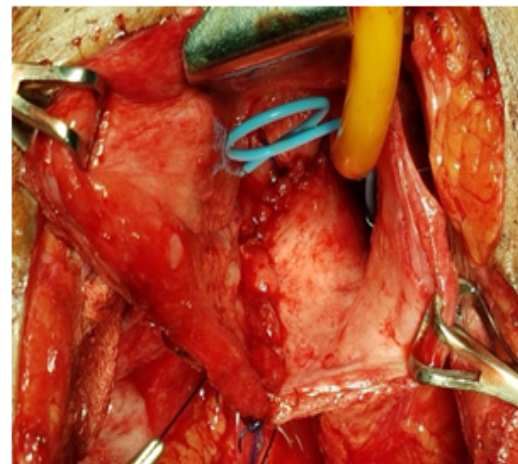
GOH'S Classification	
Type 1	39
Type 2	1
Type 3	3
Type 4	0

**Table 4:**

Mean age in years	41.1 yrs
Mean interval since presentation in [months]	5.9 months
Mean hospital stay in days (range)	(15±4) 8 -21 days
Mean operating time	120±45 min

**Table 5:**

Size of fistula	
<1 cm	21
1.0 -3 cm	16
>3 cm	6

**Ileal Augmentation****Bladder Autorotation Flap****Figure 1:**

The mean age of these women was 41.1 years (range 26 -54 yrs). Two cases of ureteric fistulas developed during surgery for endometriosis. Two cases out of 4 recurrent VVF were recurrent fistulas operated once vaginally. Both cases presented with recurrence in the trigonal region, of which one patient with diminished bladder capacity. The patient with small capacity bladder underwent augmentation with ileum. A bladder rotational flap was used in another trigonal recurrent fistula.

The average interval between onset of fistula and repair was 177 days with a range of 20-300 days. Preoperative cystoscopy identified 6 fistulas near ureteric orifices which required stenting.

Majority of the VVF cases were supratrigonal except three cases, hence we repaired all of them through trans abdominal route by O'Connors

technique. Omental interposition was done in all cases.

The Ureterovaginal fistulas were repaired by direct re-implantation (21 cases) or psoas hitch (3 cases) or with Boari Flap (2 cases) as required. The mean operating time was 120±45 min. Mean hospital stay was 15 days ± 4.1 days (Range 8 -21 days). On follow up success rate for VVF was 92.3%. There were two recurrences in our series of cases which occurred in VVF. Success of Ureterovaginal fistula was 100%.

Stent removal done after 6 weeks. On follow up success rate for VVF was 95.6% with recurrence in 1 patient. Success of Ureterovaginal fistula was 100%.

## Discussion

The true incidence of Genito-urinary fistula is unknown as many women do not reach hospital due to various socio-economic reasons. An overall prevalence has been estimated at 0.2 to 2% in different societies [2]. Its occurrence reflects the level of maternity care in a community. In case of obstructed labour, the anterior vaginal wall and underlying bladder neck are devitalized by ischaemia. The result of this is sloughing out of devitalized tissue usually between third and tenth day of puerperium resulting in fistula formation and incontinence. Other less common obstetric causes include bladder injury at caesarean section, forceps delivery.

Our series of genitourinary fistula were mainly Gynecologic in etiology, as a sequelae to total abdominal hysterectomy done for various causes. Obstructed labour was the cause in 2 patients with other obstetric cause being LSCS and LSCS with hysterectomy.

The diagnosis of fistula is straight forward, yet a preoperative evaluation must include contrast CT with Urogram and cystourethroscopy, as was done in all our cases. Cystoscopy confirms site, size, number, proximity to uretric orifice and associated bladder lesions.

All obstetric fistula was repaired at least 3 months after delivery to allow edema and inflammation to subside in our series. While excellent results have been reported by early repair by some surgeon [3,4,5,6], it may not be always true in all cases. As for the route of repair, abdominal route was preferred by us as majority VVF cases in our series were supratrigonal only two are subtrigonal and one trigonal. Various grafts and flaps were used as interposition between the repaired bladder and vagina.

They promote healing and decrease the chance of fistula recurrence as suggested in studies of trans-abdominal repair<sup>8</sup>. We used omental graft in all cases with trans-abdominal repair. The interposed tissue served to fill the dead space, added bulk to repair and improved blood supply at fistula site.

In our series an overall success of 92.3 % in VVF and 100% in UVF was in keeping with other series. Gousee et al [8] evaluated use of interposition grafts showed success rate of 93 % and 63% without graft.

Also higher failure rates are recognized when there was excessive scarring of fistula margin after previous failed attempts. Although repeat operations are justified, the success rate decreases

progressively with increasing number of previous unsuccessful procedures [9]. Thus the primary repair should be well planned to offer the woman the best chance of continence.

## Conclusion

Genitourinary fistulas are not life threatening but are socially debilitating condition. Surgical repair is the definitive cure.

Optimize outcome of surgery by modifying techniques

- With adequate training and experience
- Delaying vvf repair for 2-3 months till edema subside
- Modified o'connor's technique with interposition grafts
- Continuing perurethral foley catheter for 4-6 weeks
- The best chance of successful repair is at the first attempt.

The success rate of primary surgical repair is as high as 85 to 95%.

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