

## Genitourinary Fistula: An Indian Perspective

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### Abstract

**Background** In developing countries, obstetric trauma is the most common cause of genitourinary fistulae. But over the last two decades, health care facilities have been improved and the scenario has been changed.

**Purpose** The aim of the present study is to share our experience with genitourinary fistula in terms of mode of presentation, diagnostic modality, and management with the emphasis on the surgical approach and a parallel review of the available literature.

**Materials and Method** During a 6-year period from January 2007 to December 2013, 41 cases of genitourinary fistula, who admitted and treated in the urology department of a tertiary care center, were retrospectively analyzed for

etiology, site, size and number of fistulae, clinical presentation, diagnostic modalities, and management. The literature search was done using the Medline database.

**Result** Mean age of the patient was 27 years (range 16–51). Primary and simple fistulae were common. Obstetric trauma was the most common etiology (56.09 %) followed by iatrogenic (39.03 %). Vesicovaginal fistula was the most common type (78.37 %) and trigone was the most common site involved (51.72 %). 51.35 % of patients were approached successfully by the vaginal route. Ancillary procedures were required in patients for various other associated anomalies at the time of fistula repair. The success rate on follow up was 94.5 %. In the mean follow up of 3 years, 35 patients were sexually active.

**Conclusion** Genitourinary fistula is a frustrating entity with potentially devastating psychosocial consequence. Its management poses a tricky challenge to the surgeon. Accurate and timely diagnosis, adhering on basic surgical principle, and repair by an experienced surgeon provide the optimum chance of cure.

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## Introduction

Genitourinary fistula remains a frustrating condition with devastating consequences for the patient in developing countries. Its worldwide incidence is more than 100,000 cases per year [1]. In developing countries, 90 % of these fistulae are consequence of neglected and obstructed labor [2, 3]. In developed countries, these are mostly due to the complications of surgery or radiation therapy for cancer [4]. Although advances occurred in the understanding of etiopathogenesis, diagnosis, and management, it still poses challenges to the treating surgeon because of the controversies regarding the optimum time of repair and the ideal surgical approach.

## Materials and Methods

During a 6-year period from January 2007 to December 2013, 41 retrospective cases of genitourinary fistula, who admitted and treated in our hospital, were analyzed for etiology, site, size and number of fistulae, clinical presentation, diagnostic modalities, and management (Table 1). The literature search was done using the Medline database.

All the patients were evaluated for history, clinical examination, baseline investigation, ultrasonography abdomen, and intravenous urography (I.V.U). Cystoscopy was done to know the site, size and number of fistula, and the condition of surrounding mucosa. Vaginal speculum examination was done to know about vaginal capacity and

mucosa integrity. The methylene blue dye test was done when the fistula opening was not obvious on the examination. After this initial work-up, fistulae were divided into two groups, simple and complex (Table 2). The route and type of surgical repairs were individualized according to the classification of fistulae and accessibility of the fistula tract. Simple fistulae were approached by vaginal route, while the complex fistulae were approached through abdominal route. All the patients were followed up initially monthly and then at 3 and 6 months.

## Results

The mean age of the patients was 27 year (range 16–51). The characteristics of the fistula are shown in Tables 1 and

**Table 2** Characteristics of fistula

Type of fistula	Description	No. of cases
Primary		29
Secondary		12
Nature of fistula		
Simple		19
Complex		
	Fistula greater than 4 cm	05
	Recurrent fistula greater than 2 cm	02
	Fistula involving urethra	04
	Fistula involving rectum	03
	Fistula requiring ureteric reimplantation	05
	Fistula requiring bladder augmentation	01
	Fistula due to genitourinary tuberculosis	02

**Table 1** Site and etiology of genital tract fistula

Type of fistula	Site	Etiology	No. of cases	Percentage
Vesicovaginal fistula			29 (total)	70.73
		Obstetrics trauma	19	
		Iatrogenic	08	
		Genito urinary tuberculosis	02	
		Supratrigonal	09	
		Interureteric	02	
		Trigonal	15	
	Bladder neck	03		
Uretero vaginal fistula		Iatrogenic	6	14.63
Vesico uterine fistula		Iatrogenic	2	4.87
Urethro vaginal fistula		Obstetrics trauma	1	2.43
Rectovaginal vesical fistula		Obstetrics trauma	3	7.31

2. Primary and simple fistulae were common. Obstetric trauma was the most common etiology (56.09 %) followed by iatrogenic (39.03 %). Vesicovaginal fistula was the most common type (78.37 %) and trigone was the most common site involved (51.72 %). 51.35 % of patients were approached successfully by the vaginal route. Ancillary procedures were required in patients for various other associated anomalies at the time of fistula repair. This includes bilateral ureteric implantation in five, abdominal hysterectomy in three, coloanal anastomosis in two, and bladder neck closure with Mitrofanoff in two patients. The success rate on follow up was 94.5 %. In two failed cases, initially procedure was done with transvaginal route which was latter repaired by abdominal approach. In the mean follow up of 3 years, 35 patients were sexually active. They had an initial complaint of mild dyspareunia which gradually reduced in intensity over 12–18 months.

## Discussion

Genitourinary fistula is the most distressing complication of obstetrics and gynecological procedures, especially in developing countries with low standard of antenatal and obstetrical care [2, 3]. In developing countries, its incidence range was 1–3 per 1,000 deliveries [5]. Important risk factors are early age pregnancy, cephalopelvic disproportion, and poor antenatal care. Resulted obstructed labor usually causes larger fistula because of pressure necrosis of anterior vaginal wall, bladder neck, and urethra [3].

In developed countries, iatrogenic injury during the gynecological surgery (mainly the hysterectomy) is the common cause. Hysterectomy per se accounts for the vast majority of bladder (2.9 %) or ureteric injuries (1.8 %) and subsequent fistula formation [6, 7]. Pelvic malignancy, pelvic irradiation, obstetrical infection, trauma, and foreign body erosion are other common risk factors [5]. The close anatomical relationship of the bladder, vagina, and uterus makes the reproductive tract susceptible to fistula formation during complicated childbirth and gynecological surgery.

Vesicovaginal fistulae (VVF) remain the most common variety, with more than 80 % of cases worldwide resulting from obstructed labor [2, 5]. Similarly, in our study, VVF were the most common (70.74 %) type and 65.5 % of these were caused by an obstetric trauma. The incidence of less commonly reported Vesicouterine fistula (VUF) and Vesicocervical fistula (VCF) is also increasing because of increasing rates of lower segment cesarean section (CS) with the possibility of bladder damage [6, 8, 9]. Both the cases of VUF in this study were caused by CS. Apart from these, ureterovaginal fistulae (UVF) are also generally

caused by gynecological surgery and half of them account for hysterectomy [7]. Out of total six cases of ureterovaginal fistula seen in this study, five appeared after hysterectomy and one after CS.

In our series, obstetrical trauma was the main cause resulting in larger size fistula formation involving mainly in the trigone and the bladder neck region. Such patient usually present with urinary leakage per vaginum in the postoperative period. Sometime such injury may be unrecognized and patient may have prolong ileus or excessive pain. Fistula can also develop at distant interval after pelvic irradiation or secondary to local malignancy. In our study, vesicovaginal and rectovaginal vesicle fistulae were symptomatic after removal of catheter in postoperative period, while ureterovaginal cases were symptomatic in the immediate postoperative period.

Although the diagnosis of fistula is straight forward many a times, work-up must include intravenous urography to rule out co-existing ureteric injury which may be present in 10–15 % of cases [5]. Cystoscopy as well as vaginal examination must be done for direct visualization of fistula and surgical planning. Intravesical Methylene Blue may help with localization of non-visible fistula. In our series, co-existing ureter injury was present in six patients. All of these patients had a history of hysterectomy done outside.

Conservative therapy provides little hope for cure. Usually the initial practice is to provide proper bladder drainage with antibiotics. Its success has been reported in a small number of cases of small fistula after iatrogenic injury with the prolong catheterization (range from 19 to 54 days) [10]. None of our cases show the healing of fistula after 1 month of catheterization. Some success has been reported with electrocoagulation of the smaller fistula tract (less than 3 mm in diameter), either transvaginally or transurethrally with tiny electrode and minimal coagulation current [1, 11]. In this study, electrocoagulation was successfully tried in one case of the small supratrigonal VVF. Fibrin Glue is also used as an attractive tissue sealant for small fistula. It is biodegradable and promotes healing through its effect on fibroblast and collagen synthesis. Its reported success rate is 60–80 % in many series, but their results could not be generalized as all these studies have small number of cases [1, 12].

Once the conservative trial fails, surgical correction of the fistula becomes necessary. There is no consensus about the timing or the surgical technique of the fistula repair [13]. The classical view is to delay the repair for 3–6 months to allow the inflammation to subside. A caution and balance should be maintained in preoperative waiting between the benefit of delayed repair and psychosocial distress haunting the patient due to the ongoing leakage [13]. We believe that early catheterization and

waiting for the disappearance of an inflammatory reaction at the fistula site provide better postprocedure success rate.

Regardless of the approach and technique, principles of the repair remain the same. It should be tension-free, watertight, multi-layer closure with avoidance of overlapping suture line. The tissues at the site of the repair should be healthy and non-infected, and a well-vascularised interposition flap should be used if required. Efforts must be made to minimize urinary tract injuries by doing sharp and accurate dissection, meticulous hemostasis, and adequate mobilization of the bladder from the uterus and ureter identification [14]. Longer operating times, surgical blood loss exceeding 1,000 ml, large uterine size, and bladder injury extending into the trigone increase the risk of development of fistulae [15]. The surgery should be well planned and performed by a surgeon experienced in fistula repair as first repair has the highest chance of success [16].

To improve the result, various flaps may be interposed between bladder and vagina to promote healing and decrease the recurrence of the fistula. Martius (labial fat based) flap is used in vaginal approach, while omentum and peritoneal flaps are the options in abdominal approach [1, 13, 16]. We used Mauritius flap in all but one case of simple fistula with a vaginal approach, while omentum was used as an interposition flap in abdominal approach for all cases of complex fistula.

Vaginal approach avoids laparotomy, bladder splitting, long operating time, blood loss, postoperative morbidity, and prolong hospital stay [17]. Its exclusion criteria are circumferential indurations at the fistula site exceeding 2 cm, fistula location or vaginal architecture precluding adequate vaginal exposure, fistulae involving the ureter or the patient's preference for an abdominal approach after preoperative counseling. The majority of the operations are done using the Latzko or the vaginal flap techniques [1, 8, 18, 19]. Success rates ranging from 82 to 94 % have been reported for the transvaginal approach [17, 20, 21].

The abdominal approach is indicated in conditions such as inadequate exposure related to a high or retracted fistula in a narrow vagina or when fistulous tract is in close proximity to the ureter. It is also preferred in the repair of complex, multiple, and recurrent fistulae, in conditions where associated pelvic pathology requiring simultaneous abdominal exploration or when surgeon is inexperienced with vaginal surgery [1, 17, 21, 22]. It has a reproducible and durable success rate from 94 to 100 % [21–23]. In our study, we found that transvaginal approach has advantages over the transabdominal approach in terms of shorter mean operative time (91 vs. 153 min), lesser blood loss (mean value 180 vs. 320 ml), decreased analgesic requirement, and shorter hospital stay (7 vs. 10 days).

For a very complex fistula, a combined transabdominal and transvaginal approach has been reported [17, 22].

Laparoscopic approach for fistula repair is based on the principle of the abdominal approach with the added advantage of minimum invasive approach like magnification during the procedure, hemostasis, decreased abdominal pain and a shorter hospital stay with quicker recovery, improved cosmesis, and early return to work. Laparoscopic VVF repair is a feasible and an efficacious approach with a successful outcome in a majority of the patients but it requires the experience in pelvic surgery and intracorporeal suturing [4, 17, 23]. We had successfully repaired two cases of supratrigonal VVF but conversion to open procedure had to be done in initial seven cases attempted laparoscopically because of the difficult plane of dissection in three primary and two cases of recurrent fistula. Difficult intracorporeal suturing contributes conversion in two cases of low lying trigonal fistula. Recently introduced DA Vinci robot system for fistula repair provides superior 3D magnified view, better dissection, hemostasis, and suturing with reduced operator fatigue but it is a costly affair at present [24, 25].

## Conclusion

Genitourinary fistula is a frustrating condition not only for the patient but also for the treating surgeon. In our population, obstetric and iatrogenic injuries remain the leading cause. Accurate and timely diagnosis, adherence with basic surgical principle, and repair by experienced surgeon provide the optimum chance of cure.

**Compliance with Ethical Requirements and Conflict of Interest** It is declared in the forwarding letter that according to our institutional protocol, ethical committee clearance is not required for the retrospective observational and analytic studies. As the present study is a retrospective analytical study, institutional ethical committee clearance is not obtained.

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