

## Original Research Article

### A case series of urogenital fistulas

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#### ABSTRACT

**Background:** Urogenital fistula is an abnormal fistulous communication that occurs between the bladder and cervix or uterus; between the ureter and vagina, uterus, or cervix; and between the urethra and vagina. Most cases in developing countries are of obstetric etiology, resulting from prolonged neglected obstructed labour, and around 1–2 per 1000 deliveries may be affected. The majority of UGFs in developed countries are a consequence of gynecological surgery, mainly hysterectomies. Present study focuses on the various presentations and the different modalities of surgeries done for cases of urogenital fistulas at our institute.

**Methods:** A total 19 cases of urogenital fistula were studied in detail as per proforma. Two patients were operated on emergency basis because of early presentation in postoperative period. For others a pre-operative waiting period of 3–6 months was followed after development of fistula. During this period initially bilateral DJ stenting was tried in all patients, in hope of spontaneous closure of fistulas. Two patients whose fistulas closed spontaneously are not subjected to surgery. Rest all cases were managed surgically by standard surgical procedures.

**Results:** Study was conducted between, February 2015 to February 2017. A total 19 patients studied. In 2 patients, fistula healed spontaneously while in 17 patients, surgery was needed. Most common age group affected is 2nd decade of life about 47.36%. In our study gynecological surgeries predominate with 57.89% followed by obstetric cases in 26.31%. Most of patients presented with continues dribbling of urine through vagina with normal voiding pattern in about 78.94% of cases. Overall transabdominal procedures had nearly 100% success rate, mainly because of better dissection, visualization and use of vascularized graft which prevents recurrence. 1 recurrence was seen in transvesical extraperitoneal approach because of undiagnosed another fistulous tract. Ureteric reimplantation was 100% successful in ureterogenital fistulas. Vaginal approach with use of Mortius flap had 75% success rate with 1 recurrence because of flap necrosis. Mean duration of surgery was 120 minutes and mean hospital stay was 8 days..

**Conclusions:** Urogenital fistulas are the most distressing complications of obstetric and gynecological surgeries. Obstetric causes predominate in developing countries while gynecological surgeries predominate in developed countries. Despite the good results of surgical repair, attempt should be focused on the prevention of VVF.

**Keywords:** Mortius flap, Urogenital fistulas

#### INTRODUCTION

Urogenital fistula is an abnormal fistulous communication that occurs between the bladder and cervix or uterus; between the ureter and vagina, uterus, or cervix; and between the urethra and vagina.<sup>1</sup> It has been

estimated that there are currently 2–3 million women with untreated fistula worldwide, and perhaps 30000–130000 new cases occur annually of which >95% are in the developing world. Most cases in developing countries are of obstetric etiology, resulting from prolonged neglected obstructed labour, and around 1–2 per 1000

deliveries may be affected.<sup>2-4</sup> The majority of UGFs in developed countries are a consequence of gynecological surgery, mainly hysterectomies. Other causes are iatrogenic trauma, radiotherapy, infections, malignancy etc. which are less common.<sup>1</sup> An accurate diagnosis is paramount before consideration of repair. A variety of methods are available to the clinician, and any excessive or suspicious vaginal discharge in a patient who recently underwent pelvic surgery or who has a history of pelvic radiotherapy should be evaluated promptly for a UGF.<sup>1</sup> Present study focuses on the various presentations and the different modalities of surgeries done for cases of urogenital fistulas at our institute.

## METHODS

This was a prospective study conducted at GMC & SSH Nagpur in Department of Urology from February 2015 to February 2017 for a period of 2 years. A total 19 cases of urogenital fistula were studied in detail as per proforma. Two patients were operated on emergency basis because of early presentation in postoperative period. Both the cases presented with bilateral accidental clamping of ureters during abdominal hysterectomy. For others a pre-operative waiting period of 3-6 months was followed after development of fistula. During this period initially bilateral DJ stenting was tried in all patients, in hope of spontaneous closure of fistulas. Two patients whose fistulas closed spontaneously are not subjected to surgery. Rest all cases were managed surgically by standard surgical procedures.

Selection criteria for abdominal repair (O'Conors) - Fistulae located near to ureteric orifices that might require ureteric reimplantation and fistulas located high in bladder wall and of large size. Selection criteria for vaginal repair -Fistulae located just proximal to bladder neck and urethrovaginal fistulas. Abdominal procedures includes interposition of vascularised flap with omentum in O'Conors approach, transvesical extraperitoneal approach and ureteric reimplantation while vaginal approach used Martius flap for reconstruction. All patients who were dealt by abdominal approach were allowed oral feeds once peristalsis has set in. All surgically managed patients weather by vaginal route or open O'conors and transvesical extra peritoneal route were kept on ureteral drainage via ureteral stents for 10 days while SPC catheter and perurethral foleys catheter drainage for 3 weeks. For ureteric reimplantation procedure, DJ stents were kept for 6-8 weeks. Recurrence of leak in post-operative period was considered as failure. All cases were followed up for a period of 6 months post-operatively.

## RESULTS

### Age group

Fistulas are related mainly to the reproductive age group because of increased obstetric and gynecological

surgeries in this period. In our study most common age group affected is 2<sup>nd</sup> decade of life about 47.36%, followed by 4<sup>th</sup> decade about 21.05%. Single case before twenty years was because of pelvic trauma in road traffic accident. After 5th decade incidence was 10.53% and was because of malignancy (Table 1).

**Table 1: Age group.**

Age group	No of patients	Percentage
<20	1	5.26%
21-30	9	47.36%
31-40	3	15.79%
41-50	4	21.05%
>50	2	10.53%

### Etiology

In our study gynecological surgeries predominate with 57.89% followed by obstetric cases in 26.31%. Cervical malignancy comprises about 10.53% followed by 5.27% of traumatic etiology (Table 2).

**Table 2: Etiology.**

Etiology	No of patients	Percentage
Abdominal hysterectomy	11	57.89%
Vaginal hysterectomy	0	0
Post ceserian section	3	15.78%
Obstructed labour	2	10.53%
Cervical malignancy	2	10.53%
Idiopathic	0	0
Trauma	1	05.27%
Congenital	0	0
Infection	0	0
Radiotherapy	0	0

### Presentation

Most of patients presented with continues dribbling of urine through vagina with normal voiding pattern in about 78.94% of cases. Patients having urethrovaginal fistulas or fistulas with sphincter involvement had incontinence of urine and represent about 21.06% of cases (Table 3).

**Table 3: Presentation.**

Presentation	No. of patients	Percentage
Continues dribbling of urine through vagina with normal voiding pattern	15	78.94%
Continues dribbling of urine with incontinence of urine	4	21.06%

### Site of fistula

Overall the most common site of fistulas was vesico-vaginal in about 52.63% of cases followed by urethra-vaginal in 21.06%. Vesico-uterine represents about 10.53% and uretero-vaginal about 15.78% (Table 4).

**Table 4: Site of fistula.**

Site of fistula	Number of patients	Percentage
Vesico-vaginal	10	52.63%
Vesico-uterine	2	10.53%
Uretero-veginal	3	15.78%
Urethro-vaginal	4	21.06%

### Size of fistulas

Average size of fistula in our study ranges from 0.3 cm to 4cm, with mean size of 1.2 cm. The size and location of the fistula determines the degree of leakage. Patients with small fistulae may void normal amounts of urine and notice only slight position-dependent drainage (Table 5).

**Table 5: Size of fistula.**

Size of fistula	Number of patients	Percentage
< 0.5 cm	2	10.52%
0.5 -1 cm	8	42.11%
1-2 cm	6	31.58%
>2 cm	3	15.79%

### Single or multiple

Majority of fistulas in our study are single in about 84.21% followed by multiple fistulas in 15.79%. Multiple fistulas are important because they may be missed during examination and surgery resulting in recurrence in postoperative period (Table 6).

**Table 6: Single or multiple.**

Type	No. of patients	Percentage
Single	16	84.21%
Multiple	3	15.79%

### Surgical procedures

Abdominal procedures predominate in the surgical practice as they allows greater mobilization of both genital organs and bladder, better visualization of fistulous tract and complete excision of tract with grafting of vascularized tissue as interposition flap.

Majority of patients operated in present study are by transabdominal procedures in about 13 patients comprising about 68.42%. Vaginal approach with Mortius flap was used in 21.06% of cases. 2 patients managed on conservatively, one by DJ stent in case of partial uretero-vaginal fistula and other by continues

Foleys catheter drainage in case of small vesico-vaginal fistula (Table 7).

**Table 7: Surgical procedures.**

Surgical procedures	No. of patients	Percentage
O' Conors procedure	7	36.84%
Transvesical extraperitoneal	3	15.78%
Ureteric reimplantation	3	15.78%
Vaginal approach with Mortius flap	4	21.06%
Conservative	2	10.52%

### Success rate according to various procedures

Overall transabdominal procedures had nearly 100% success rate, mainly because of better dissection, visualization and use of vascularized graft which prevents recurrence. One recurrence was seen in transvesical extraperitoneal approach because of undiagnosed another fistulous tract.

Ureteric reimplantation was 100% successful in ureterogenital fistulas. Vaginal approach with use of mortius flap had 75% success rate with one recurrence because of flap necrosis (Table 8).

**Table 8: Success rate according to various procedures.**

Surgical procedure	No. of patients	Success rate
O' Conors approach	7	100%
Transvesical extraperitoneal	3 (1 recurrence)	66%
Ureteric reimplantation	3	100%
Vaginal approach with Mortius flap	4 (1 recurrence)	75%

### Postoperative complications

Recurrence was most feared and distressing complication post-surgery. It was seen in about 2 patients making 10.52%. Ileus was seen after transperitoneal procedures and resolved on bowel rest and nasogastric aspiration.

Subcutaneous wound infection was seen in 2 patients and managed on intravenous antibiotics and wound dressing (Table 9).

**Table 9: Postoperative complications.**

Postoperative complications	No. of patient	Percentage
Postoperative infection	2	10.52%
Postoperative ileus	1	5.26%
Urinary tract infection	2	10.52%
Recurrence	2	10.52%

## DISCUSSION

The study was conducted between, February 2015 to February 2017. Total 19 patients were included in study. Seventeen patients operated by either abdominal or vaginal route and 2 patients had spontaneous closure of fistula, one after bilateral DJ stent and another after Foleys catheter drainage.

### Age group

The mean age of our study group was about 34 years which is comparable to previous studies conducted by N. Ramamurthy et al (34.6 years), Kapoor et al (32 years) and Tariq et al (35 years).<sup>5-7</sup> The most common age group affected was 2<sup>nd</sup> and 3<sup>rd</sup> decade of life with combined incidence of about 63.15%. Similar incidence was seen in R. Mathur et al (56%) and Saaqib S et al (77.04%).<sup>8,9</sup> High incidence was mainly as a result of major obstetrics and gynecological surgical procedures like cesarean section and hysterectomies during this age group (Table 10).

**Table 10: Comparison of age group.**

Age group	Percentage	Mathur R et al <sup>8</sup>	Saaqib S et al <sup>9</sup>
<20	5.26%	4%	6.55%
21-30	47.36%	36%	47.54%
31-40	15.79%	20%	29.50%
41-50	21.05%	28%	13.11%
>50	10.53%	12%	3.28%

### Etiology

Majority of cases in our study are following gynecological surgeries mainly following abdominal hysterectomies in 57.89%. Obstetric causes like post LSCS and obstructed labour causing 26.31% cases. These findings were comparable to previous studies conducted by N. Ramamurthy et al (72% gynecological surgeries and 28% obstetric surgeries) and large series conducted by Paul Hilton (45.68% gynecological surgeries and 10.91% obstetric surgeries in total 348 patients).<sup>2,5</sup>

In contrast to our study Mathur R et al and Saaqib et al had more number of patients related to obstetric causes, 52% and 70% respectively.<sup>8,9</sup>

Overall obstetric causes of urogenital fistulas predominate in developing countries due to poor delivery services in rural areas, illiteracy, poor socioeconomic status and malnutrition. While in developed countries it was predominantly due to inadvertent bladder injury during pelvic surgery (90%). Such injuries include unrecognized intraoperative laceration of the bladder, bladder wall injury from electrocautery or mechanical crushing, and the dissection of the bladder into an incorrect plane, causing avascular necrosis and

inadvertent placement of sutures through the bladder wall (Table 11).<sup>1</sup>

**Table 11: Comparison of etiology.**

Etiology	Percentage	Mathur R et al <sup>8</sup>	Saaqib S et al <sup>9</sup>
Abdominal hysterectomy	57.89%	28%	28%
Vaginal hysterectomy	0	8%	-
Post ceserian section	15.78%	16%	33%
Obstructed labour	10.53%	36%	37%
Cervical malignancy	10.53%	-	-
Idiopathic	0	8%	-
Trauma	05.27%	-	2%
Congenital	0	-	-
Infection	0	-	-
Radiotherapy	0	4%	-

### Presentation

The majority of patients present with continues dribbling of urine through vagina with normal voiding pattern in 78.94%, while rest of patients presented with incontinence of urine. It is comparable to previous study conducted by N. Ramamurthy et al.<sup>5</sup> Incontinence of urine whenever present was mainly because of low level of fistulas with involvement of either bladder neck, sphincter mechanism or urethra.

The uncontrolled leakage of urine into the vagina is the hallmark symptom of patients with UGFs. Patients may complain of urinary incontinence or an increase in vaginal discharge following pelvic surgery or pelvic radiotherapy with or without antecedent surgery. The drainage may be continuous; however, in the presence of a very small UGF, it may be intermittent. Increased postoperative abdominal, pelvic, or flank pain; prolonged ileus; and fever should alert the physician to possible urinoma or urine ascites and mandates expeditious evaluation. Recurrent cystitis or pyelonephritis, abnormal urinary stream, and hematuria also should initiate a workup for UGF.<sup>1</sup>

The time from initial insult to clinical presentation depends on the etiology of the UGF. A UGF secondary to a bladder laceration typically presents immediately. Approximately 90% of genitourinary fistulas associated with pelvic surgery are symptomatic within 7-30 days postoperatively. An anterior vaginal wall laceration associated with obstetric fistulas typically (75%) presents in the first 24 hours of delivery. In contrast, radiation-induced UGFs are slowly progressive and may present 30 days to 30 years later (Table 12).<sup>1</sup>

**Table 12: Comparison of presentation.**

Presentation	% in present study	Ramamurthy N et al <sup>5</sup>
Continues dribbling of urine through vagina with normal voiding pattern	78.94%	62.85%
Continues dribbling of urine with incontinence of urine	21.06%	37.15%

**Site of fistulas**

Overall most common fistulas are vesico-vaginal comprising about 52.63% in present study, followed by ureter-vaginal in 15.78%, urethra-vaginal in 21.06% and vesico-uterine in 10.53%. Similar findings are seen in previous studies of Mathur R et al (VVF 64%), Saaqib et al (VVF 70.49%) and Paul Hilton (VVF 73.6%) (Table 13).<sup>2,8,9</sup>

**Table 13: Comparison of site of fistula.**

Site	%present study	Mathur R et al <sup>8</sup>	Saaqib S et al <sup>9</sup>	Hilton P <sup>2</sup>
Vesico-vaginal	52.63%	64%	70.49%	73.6%
Vesico-uterine	10.53%	8%	17.39	3.2%
Uretero-vaginal	15.78%	-	8.20%	6%
Urethro-vaginal	21.06%	8%	4.92%	10.9%
Others	-	20%	-	6.3%

**Size of fistulas**

Average size of fistula in our study ranges from 0.3 cm to 4cm, with mean size of 1.2 cm. N. Ramamurthy et al<sup>5</sup> in

this study of 35 cases of VVF had average size of 0.5 to 5cm. Mathur R et al found 68% of fistulas with size range between 1 to 3 cm.<sup>8</sup>

The size and location of the fistula determines the degree of leakage. Patients with small fistulae may void normal amounts of urine and notice only slight position-dependent drainage.

Alternatively, they may experience leakage only at maximal bladder capacity. The patient may present with recurrent cystitis or pyelonephritis; unexplained fever; hematuria; flank, vaginal, or suprapubic pain; and abnormal urinary stream. Women with larger fistulae may not be able to collect enough urine intravesically to void normally.<sup>10</sup> Size of fistula is also important because fistulas <0.5cm can get closed spontaneously if proper drainage was established by either DJ stents or by Foleys catheter drainage (Table 14).

**Surgical procedures for treatment**

Both vaginal and abdominal routes of surgery are utilized depending on the site, size and associated complications of fistulas. Most cases were operated by abdominal route in about 66.70% (36.84% by O' Conors transabdominal transperitoneal approach and 15.78 each for transvesical extraperitoneal and ureteric reimplantation). In other studies Saaqib et al (65.57%) and Paul Hilton (69.07%) mainly utilized vaginal approach for repair. While N. Ramamurthy et al (57%) and Mathur R et al (44%) mainly utilized abdominal approach (Table 15).<sup>2,5,8,9</sup>

**Table 14: Comparison of size of fistula.**

Size of fistula	Percentage	Mathur R et al <sup>8</sup>
<0.5 cm	10.52%	-
0.5 -1 cm	42.11%	20%
1-2 cm	31.58%	32%
>2 cm	15.79%	48%

**Table 15: Comparison of surgical procedures for treatment.**

Surgical procedures	Percentage	N. Ramamurthy et al <sup>5</sup> (35 patients)	R. Mathur et al <sup>8</sup> (50 patients)	Saaqib S et al <sup>9</sup> (61 patients)
O' Conors approach	36.84%	48.5%	44%	24.59%
Transvesical extraperitoneal	15.78%	8.5%	-	-
Ureteric reimplantation	15.78%	-	-	-
Vaginal approach with Martius flap	21.06%	17.1%	28%	65.57%
Combined vaginal and abdominal	-	-	16%	3.27%
Conservative	10.52%	-	12%	6.55%

Surgery is the mainstay of therapy for urogenital fistulae. Following the tenets of Sims, Symmonds proposed several surgical principles to improve the success rate of

fistula repair: (a) wide mobilization of the vaginal epithelium to expose the bladder; (b) excision of all scar tissue, even at the risk of increasing the size of the fistula in an attempt to create a fresh bladder injury• (this



recommendation is not universally endorsed); (c) a tension-free layered closure of the bladder and the vagina; (d) nontraumatizing technique; (e) good hemostasis; and (f) bladder drainage postoperatively.<sup>10</sup> In most cases, the gynecologic surgeon will favor the vaginal approach, which avoids the potential morbidity associated with abdominal surgery and is believed to provide a quicker recovery and a more cosmetic result. Because it does not require a laparotomy, it is considered to be easier, safer, and more comfortable for the patient. Success rates of 98% and 100% have been reported in two of the larger series.<sup>10</sup> Although an abdominal approach has traditionally been favored for larger fistulae, fistulae located high on the posterior wall, fistulae adjacent to the ureters, and concurrent intraabdominal pathology. Involvement of the ureter also may require an abdominal approach to facilitate ureteral reimplantation. Laparotomy is necessary in fistulae requiring bowel for augmentation cystoplasty. In certain circumstances, a combined vaginal and abdominal approach may be helpful.<sup>10</sup>

#### Success rate for various procedures

The success rate of abdominal surgeries is about 92.3% in as compared to vaginal procedures about 75%. These

findings are similar to Ramamurthy N et al<sup>5</sup> with 95% success rate with abdominal procedures.<sup>5</sup> In contrast Saaqib S et al and Paul Hilton found better success rate in vaginal procedures.<sup>2,9</sup>

It does not mean that either of the procedure is better than other. The decision of surgical route should be taken only after taking consideration of various aspects of fistulas like etiology, site, size, location in respect to ureteral orifice, associated bowel-bladder pathology etc. (Table 16).

#### Postoperative complications

Overall recurrence was main postoperative complication of consideration and it was about 10.52%. Two patients who had recurrence in postoperative period were managed by redo surgery by O'Conors approach. No further recurrence observed. Recurrence rate of our study is comparable to Ramamurthy N et al (12%) and less in comparison to Saaqib S et al (22.96%).<sup>5,9</sup>

Similar results were found in various previous studies discussed above (Table 17). Other complications like wound infection, ileus and urinary infection were managed conservatively by antibiotics and bowel rest.

**Table 16: Comparison of success rate for various procedures.**

Surgical procedure	Present study	Ramamurthy N et al <sup>5</sup> (35 patients)	Saaqib S et al <sup>9</sup> (61 patients)	Paul Hilton <sup>2</sup>
Abdominal approach (O'Conors, Transvesical extraperitoneal and ureteric reimplantation)	92.3% (1 recurrence out of 13 patients operated)	95% (1 recurrence out of 20 patients operated)	60% (6 recurrence out of 15 operated)	83.3%
Vaginal approach with Mortius flap	75%	100%	85%	96.1%

**Table 17: Comparison of postoperative complications.**

Postoperative complications	Percentage	Ramamurthy N et al <sup>5</sup>	Saaqib S et al <sup>9</sup>
Postoperative infection	10.52%	17.4%	-
Postoperative ileus	5.26%	14.2%	-
Urinary tract infection	10.52%	3%	-
Recurrence	10.52%	12%	22.96%

## CONCLUSION

Urogenital fistulas are the most distressing complications of obstetric and gynecological surgeries. Obstetric causes predominate in developing countries while gynecological surgeries predominate in developed countries.

Vesicovaginal fistulas are the most common fistula overall. Both vaginal and abdominal surgeries are good and should be used after properly investigating the

fistula. Success rate for both the procedures ranges between 80-100% depending upon the expertise of surgeon.

Despite the good results of surgical repair, attempt should be focused on the prevention of VVF. With proper health education, improvement in the quality of surgical practice and maternity services in the country, the incidence of genitourinary fistulae will be reduced.

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