

Genitourinary Fistulas – Our Experience

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ABSTRACT

Introduction: Urogenital fistula is a physically, socially and psychologically devastating condition. Although advances occurred in the understanding of etiology, pathogenesis, 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. The objective of our study was to review cases of urogenital fistulae referred to our department over a 4-year period, with respect to etiology, types, management and outcome.

Material and methods: This was a retrospective observational study between January 2013 to January 2017 which reviewed patient charts undergoing Genitourinary fistula repair at our Institute SVIMS, Tirupati for etiology, site, size and number of fistulae, clinical presentation, diagnostic modalities, and management.

Results: A total of 49 women underwent genitourinary fistula repair at our institute between January 2013 to January 2017. The mean age of the patients was 39 years (19-58). Out of 49 cases, 35 cases were vesicovaginal fistulae (VVF), 3 fistulae were ureterovaginal, two fistulae were both VVF and ureterovaginal, 7 fistulae were urethrovaginal and one vesico-uterine fistula.

Conclusion: Genitourinary fistulas are socially debilitating. High rates of successful fistula closure can be achieved irrespective of etiology by following sound surgical principles of fistula repair.

Keywords: Genitourinary Fistulas, Urogenital Fistula, Transvaginal, Transabdominal

MATERIAL AND METHODS

This was a retrospective observational study between January 2013 to January 2017 which reviewed patient charts undergoing Genitourinary fistula repair at our Institute SVIMS, Tirupati for etiology, site, size and number of fistulae, clinical presentation, diagnostic modalities, and management.

All the patients were evaluated for history, clinical examination, baseline investigation, ultrasonography abdomen, and CT urography. Cystoscopy was done to know the site, size and number of fistulae, and the condition of surrounding mucosa. Vaginal speculum examination was done to know about vaginal capacity and mucosal integrity.

After this initial work-up, fistulae were divided into two groups, simple and complex.⁴ Complex fistula included large fistulas, recurrent fistulas, fistulas requiring ureteric reimplantation, fistulas due to radiation /genitourinary tuberculosis.

The route and type of surgical repairs were individualized according to the classification of fistulae and accessibility of the fistula tract. All the patients were followed up at least for a period of 6 months. The cure rate per repair and overall success rate of various surgical approaches were analyzed.

Vesicovaginal fistulas were approached either by

1. Transabdominal repair – classical O'Connor (BIVALVING) (figure1)/ trans-vesical
2. Transvaginal repair

Transabdominal repair was done for complex and supratriangular fistulas. Omentum was used as interposing tissue. After repair, the bladder was drained by a suprapubic and a urethral catheter with a drain in peri vesical space for 3-4 days. Catheters were removed after 3 weeks.

The transvaginal route was preferred for simple and small trigonal fistulas. Martius flap was used as interposing tissue.

INTRODUCTION

Genitourinary fistula is an abnormal communication between the genital tract and urinary system. Any part of urinary system i.e ureter, bladder, urethra may communicate with any part of genital system (uterus, vagina). Vesicovaginal fistula (VVF) is the most common genitourinary fistula.¹

The etiology and incidence of the urogenital fistula varies geographically. In developed countries, these fistulae are typically related to gynecological surgery, pelvic pathology or radiation therapy.² In contrast, urogenital fistulae in the developing countries like India are usually associated with child birth.³

Urogenital fistula is a physically, socially and psychologically devastating condition. Although advances occurred in the understanding of etiology, pathogenesis, 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. The objective of our study was to review cases of urogenital fistulae managed at our department over a 4-year period, with respect to etiology, types, management and outcome.

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A pack was placed in the vagina for 24 hrs. Indwelling Foley catheter was placed for 14-21 days.

For VVF associated with ureterovaginal fistula ureteric reimplantation with or without psoas hitch was done.

Ureterovaginal fistulae were repaired by ureteroneocystostomy (With or without Psoas hitch) using Modified Lich-Grégoire technique over DJ stent. Bladder was drained by both per urethral and suprapubic catheter 3 weeks after repair. Stent was removed after 6 weeks.

Urethrovaginal fistula were repaired transvaginally (with Martius flap/ layered closure) as shown in figure 2.

Vesicouterine fistula was repaired by transabdominal hysterectomy and layered closure of bladder with omentum as interposing tissue followed by continuous bladder drainage for 3 weeks.

RESULTS

A total of 49 women underwent genitourinary fistula repair at our institute between January 2013 to January 2017. The mean age of the patients was 39 years (19-58) with the majority of patients in 31 to 40 age group.

Out of 49 cases, 35 cases were VVF, 3 fistulae were ureterovaginal, two fistulae were both VVF and

ureterovaginal, 7 fistulae were urethrovaginal and one vesicouterine fistula.

Obstetric trauma (57.14%) was the most common cause of genitourinary fistulae followed by gynecological surgeries (32.65%) in our study. Other causes included radiation and genitourinary tuberculosis.

Obstetric trauma and gynecological surgeries were leading causes for vesicovaginal fistula while all ureterovaginal fistulae were iatrogenic. All urethrovaginal except one were due to obstetric trauma. Radiation was the cause of vesicouterine fistula in our study. (Table 1)

When types of fistulae were analyzed 25 fistulae were simple while 33 fistulae were complex which included 4 recurrent fistulae, 19 large and multiple fistulae, 5 fistulae that required ureteric reimplantation and 5 fistulae due to radiation/ GUTB.

Approach of repair (Table 2)

Out of the 35 vesicovaginal fistulae 20 were approached transabdominally while transvaginal route was used in 15 vesicovaginal fistulae.

Ureterovaginal fistulae with or without vesicovaginal fistulae were approached transabdominally.

Type	Etiology				No. of cases	%
	Obstetric trauma	Gynecology surgeries	Radiation	GUTB		
Vesicovaginal	21	10	3	1	35	71.4%
Ureterovaginal		3	-	-	3	6.12%
Both UVF and VVF	-	2	--	-	2	4.08%
Urethrovaginal	7	1	-	-	8	16.32%
Vesicouterine	-	-	1	-	1	2.04%
Total	28 (57.14%)	16(32.65%)	4(8.16%)	1(2%)		

Table-1: Etiology of genitourinary fistulas

Type of fistula	Transabdominal	Transvaginal
Vesicovaginal Fistulae (35)	20	15
Ureterovaginal fistulae	3	-
VVF + Ureterovaginal fistula	2	-
Urethrovaginal fistula	-	8
Vesicouterine fistula	1	-
Total	26	23

Table-2: Approach of repair

Method of repair	No. of patients	Failures
Transabdominal classical O'Connor (bivalving) with omental flap	12	1
Transabdominal transvesical with omentum	8	-
Ureteric Reimplantation	5	-
Abdominal hysterectomy	1	-
Transvaginal layered closure with martius flap	23	1
Total	49	2

Table-3: Method of repair

	Transabdominal	Transvaginal	p value
Mean operative time	124min	94.7min	<.0001
Mean hospital stay	8 days	6 days	<.0001
Blood transfusion	4	-	

Table-4: Transabdominal vs transvaginal

Author	Number of patients	Success rate	Approach
Eisen et al ¹⁷ (1974)	29	90	abdominal
Persky et al ¹⁸ (1979)	7	86	Abdominal (6) Vaginal (1)
O connor ¹⁵ (1980)	42	88	Abdominal
Wein et al ¹⁴ (1980)	34	88	Abdominal
Sharma ¹³	25	84	Abdominal
Evan's et al ¹⁹ (2001)	37	76	Abdominal
Patil ¹⁶	18	72.22	Vaginal
Eilber et al ²⁰ (2003)	207	97	Vaginal
Present study	35	94.285%	Abdominal (20) Vaginal (15)

Table-5: Success rates of vesicovaginal fistula repair

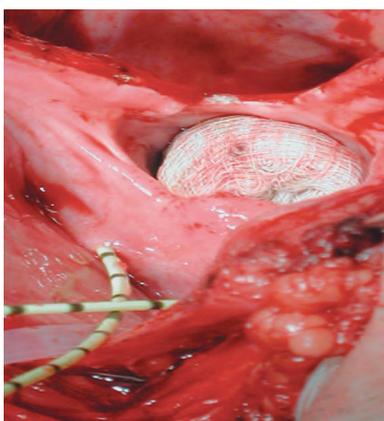


Figure-1: VVF repair – classical bivalving (o'connor)

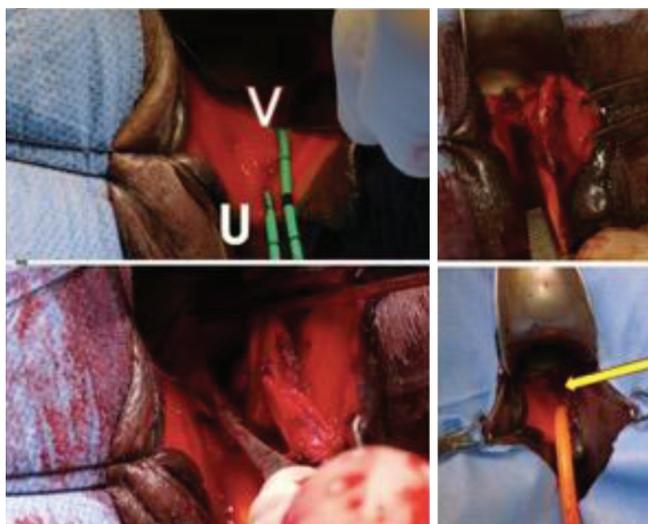


Figure-2: Urethrovaginal repair (prone -jackknife position)

All urethrovaginal fistulae were repaired transvaginally. Method of repair

Out of the total 49 genitourinary fistula repairs there were two failures with an overall success rate of 95.9%. (Table 3)

Vesicovaginal fistula

Out of 35 vesicovaginal fistula repaired 15 fistulae which were simple and accessible through vagina underwent transvaginal repair with a martius interposing flap. 20 patients needed transabdominal approach with 12 of them undergoing classical O'Connor procedure and remaining 8 patients being treated transvesically. In both approaches

omentum was used as interposing tissue.

When transvaginal and transabdominal routes were compared, mean operative time and mean hospital stay were significantly lower in transvaginal compared to transabdominal. Further no patient in transvaginal approach required blood transfusion. There were two failures one each in transvaginal and transabdominal with a total success rate of 94.3%. (Table 4)

Ureterovaginal fistula

All 3 cases of isolated ureterovaginal fistulae were repaired by ureteric reimplantation while 2 cases of combined VVF and UVF were managed by transabdominal transvesical repair with ureteric reimplantation. There were no failures in this group.

Urethrovaginal fistula

All eight cases of urethrovaginal fistulae were successfully managed through transvaginal repair with martius flap as interposing tissue.

Vesicouterine fistula

Our series included only one case of vesicouterine fistula which was successfully repaired by total abdominal hysterectomy, fistula excision and repair with omentum as interposing tissue.

Complications

- Failures: There were two failures in 49 cases with an overall success rate of 95.92%. Both failures occurred in vesicovaginal fistula and were successfully managed with a transabdominal approach.
- Other complications included irritative LUTS in 7, urinary tract infections in 8, wound infection in two patients. All these were successfully managed with conservative measures

DISCUSSION

The true incidence of genitourinary fistula in our country is unknown as many women do not reach hospital and remain neglected. An overall prevalence has been estimated at 0.2–2% in different societies.⁵ Its occurrence reflects the level of maternity care in a community and most cases are the consequence of mismanaged pregnancy, labour and delay in referral to hospital.

In our study obstetric causes were found in 28 cases (57.14%)

followed by gynecological causes in 16 cases (32.65%). With increasing use of radiation in pelvic malignancies, radiation is an important etiological factor of genitourinary fistula. In our series 4 cases (8.16%) were due to radiation while in one case (2%) tuberculosis was the cause.

Vesicovaginal fistulae (VVF) remain the most common variety, with more than 80% of cases worldwide resulting from obstructed labor.^{6,7} Similarly, in our study, vesicovaginal fistulas were the most common (71.4%) type and 60% (21 cases) of these were caused by an obstetric trauma. Other causes of VVF in our series are gynecological surgery (28.5%), radiation (8.5%) and tuberculosis (2.85%) of cases. Conservative treatment of VVF by bladder drainage has been described in the literature.⁸ In our series conservative measures were not helpful which could be due to the fact that most patients reported late after the development of the fistula. Poverty, illiteracy and social stigma are the main factors for patients not to seek consultation until the later stages of fistula development.

Vesicovaginal fistulas were repaired successfully when delayed repair was undertaken after 3–6 months to allow any inflammation and edema to settle down.^{4,9} Some authors have suggested early closure of fistulas as it reduces patient's morbidity.¹⁰ However regular follow up and cystoscopy to assess the local conditions is fundamental in selecting the earliest date for repair. In our institute fistula repair is done once local conditions are favourable as dictated by cystoscopy.

The route of surgery, i.e. abdominal, vaginal or combined, is decided on according to the preferences and expertise of the operating surgeon. The vaginal route was preferred for the benefits of low complications, minimum blood loss, rapid postoperative recovery and shorter hospital stay. Abdominal repair was reserved for complex fistulae, high on the bladder wall, as well as supratrigonal, ureterovaginal and vesicouterine fistulae.

The use of interposition flap improves the chances of good outcome.^{10,11,12} In abdominal repair omentum is the tissue of first choice. It enhances the blood supply, protects the suture line and closes the dead space. In our institute optimal results were obtained with use of omentum in abdominal approach and Martius flap in vaginal approach as interposing tissue.

In our study, of the total 35 VVFs, 33 were successful with a success rate of 94.285%. There was one failure among twenty cases approached transabdominally and also one failure in 15 cases which were repaired transvaginally with success rate of 95% and 93.33% respectively. These results are similar or superior to the results reported elsewhere.

Sharma¹³ reported 25 patients who underwent omental flap placement of which 21 were successful. Wein et al¹⁴ used the transvesical approach with interposition of peritoneum or omentum in 34 patients, of whom 30 had successful repair. O'Connor¹⁵ used a suprapubic transvesical approach for 42 patients, with successful repair in 37. Patil et al¹⁶ used a gracilis in 18 patients, with success in 13 cases. (Table 5)

Ureterovaginal fistulae (UVF) are generally due to iatrogenic mostly gynecological surgery. There were 3 cases of UVF in our series and all of them were caused by gynecological surgery. Trauma to the ureter during the surgical procedure can occasionally happen even when skilled surgeons are operating, leading to ureterovaginal fistulae. Approximately 80–90% of the injuries occur in the distal portion of the ureter, where it passes beneath the uterine vessels.²¹

Even the presence of combined vesicovaginal and ureterovaginal fistulae is not uncommon. Lee and Symmonds²² as well as Goodwin and Scardino²³ reported an incidence of 25 and 12% respectively of combined ureterovaginal and vesicovaginal fistula, which is 4.08% (2/49) in the present series. All the combined UVF and VVF (2 cases) also resulted from gynecological surgery in present series.

The timing of the surgical intervention depends on various factors including the extent of the causative operation and the condition for which it was performed, the type and timing of ureteric injury, the condition of the pelvic tissue and the patient's general condition. In small number of patients, the fistula may close spontaneously either without any intervention or with the aid of an indwelling ureteric stent.²¹ Ureteroneocystostomy is the procedure of choice in most patients with ureterovaginal fistulae. The various other reported operations are transuretero-ureterostomy combined with Boari's flap for bilateral injuries²⁴, ileal replacement of the lower ureter²² or ileal conduit diversion.²² Primary nephrectomy may be required in some cases.²⁵ In our series all renal units were salvaged with successful ureteric reimplantation. Blandy and colleagues²⁶ reported on early repair of 30 iatrogenic ureterovaginal fistulae with more than 90% success rate.

The incidence of less commonly reported²⁷ Vesicouterine fistula (VUF) is also increasing because of increasing rates of lower segment cesarean section (CS) with the possibility of bladder damage.²⁸ The single case of VUF in our series was due to radiation. Other reported causes are pelvic trauma, instrumentation, malignancy, vacuum delivery, complication of the intrauterine device, uterine artery embolization or manual removal of the placenta.²⁸

Although spontaneous healing is reported in 5% by the conservative approach²⁹, surgical repair is the definitive treatment. Surgical management depends upon fertility status of patient. We successfully managed the case with hysterectomy and layered closure.

Urethrovaginal fistulas in developing countries result mainly due to obstetric causes.³⁰ Due to advances in obstetric care, urologists in the developed world encounter urethrovaginal fistulae rarely, and many of the fistulae seen are secondary to vaginal surgery.³¹ In our series there were a total of 8 cases and 7 of them (87.5%) were due to obstetric causes.

Surgical treatment procedures include direct primary anatomical repair and interposition tissue restorations, mainly by Martius flap. We achieved desirable results in all cases with transvaginal approach and Martius flap was employed as interposing tissue.

CONCLUSION

Genitourinary fistulae are socially debilitating. Surgical treatment of genitourinary fistulae depends on size and location of fistula. Transvaginal repair was preferred whenever possible. High rates of successful fistula closure can be achieved irrespective of etiology by following sound surgical principles of fistula repair.

REFERENCES

- Goyal NK, Dwivedi US, Vyas N, et al. A decade's experience with vesicovaginal fistula in India. *Int Urogynecol J* 2007; 18: 39–42.
- Moir JC. Vesico-vaginal fistulae as seen in Britain. *J Obstet Gynaecol Brit Commonw* 1973; 80: 598–602.
- Rathee S, Nanda S: Vesicovaginal fistula: a 12-years study. *J Indian Med Assoc* 1995; 93:93–94.
- Priyadarshi V, Singh JP et al Genitourinary Fistula: An Indian Perspective. *J Obstet Gynaecol India*. 2016;66:180-4.
- Thomson JD: Vesicovaginal and urethrovaginal fistula; in Rock JA, Thomson JD (eds): *Te Linde's Operative Gynecology*, 8th ed. Philadelphia, Lippincott, 1997,1175–1205.
- Hilton P, Ward A. Epidemiology and surgical aspects of urogenital fistula: a review of 25 years' experience in Southeast Nigeria. *Int Urogynecol J Pelvic Floor*. 1998; 9:189–94.
- Nawaz H, Khan M, Tareen FM, et al. Retrospective study of 213 cases of female urogenital fistulae at the department of urology and transplantation civil hospital Quetta, Pakistan. *J Pak Med Assoc*. 2010;60:28–32.
- Davis RJ, Miranda S: Conservative treatment of vesicovaginal fistula by bladder drainage alone. *Br J Urol* 1992; 70: 339.
- Fearl CL, Keizur LWA. Optimum time interval from occurrence to repair of vesicovaginal fistula. *Am J Obstet Gynecol* 1969; 104: 205–208.
- Kumar S, Kekre NS, Gopalakrishnan G. Vesicovaginal fistula: an update. *Indian J Urol*. 2007; 23:187–91.
- Wong MJ, Wong K, Rezvan A, et al. Urogenital fistula. *Female Pelvic Med Reconstr Surg*. 2012;18:71–8.
- Garthwaite M, Harris N. Vesicovaginal fistulae. *Indian J Urol*. 2010; 26:253–6.
- Sharma SK: Pedicled omental graft in repair of large, difficult vesicovaginal fistula. *Inter Gynecol Obstet* 1980; 17: 556–559.
- Wein AJ, Carpincello VL, and Murphy JJ: Repair of vesicovaginal fistula by suprapubic transvesical approach. *Surg Gynecol Obstet* 1980; 150: 57–60.
- O'Connor VJ: Review of experience with vesicovaginal fistula repair. *J Urol* 1980; 123: 367–369.
- Patil U, Waterhouse K, Laungani G. Management of 18 difficult vesicovaginal and urethrovaginal fistulas with modified Ingleman Sundberg and Martius operations. *J Urol* 1980; 123: 653–656.
- Eisen M, Jurkovic K, Altwein JE, et al. Management of vesicovaginal fistulae with peritoneal flap interposition. *J Urol* 1974;112:195–8.
- Persky L, Herman G, Guerrier K. Non-delay in vesicovaginal fistula repair. *Urology* 1979; 13: 273–275.
- Evans DH, Madjar S, Politano VA et al. Interposition flaps in transabdominal vesicovaginal fistula repair: are they really necessary? *Urology* (April) 2001; 57: 670–674.
- Eilber KS, Kavalier E, Rodriguez LV, et al. Ten-year experience with transvaginal vesicovaginal fistula repair using tissue interposition. *J Urol* 2003; 169:1033–6.
- Mandal AK, Sharma SK, Vaidyanathan S, et al. Ureterovaginal fistula: summary of 18 years' experience. *J Urol* 1990; 60: 453–456.
- Lee RA, Symmonds RE. Ureterovaginal fistula. *Am J Obstet Gynecol* 1971; 109: 1032–1035.
- Goodwin WE, Scardino PT. Vesicovaginal and ureterovaginal fistulas: a summary of 25 years of experience. *J Urol* 1980; 123: 370–374.
- Weems WL. Combined use of bladder flap and transureteroureterostomy: report of a case. *J Urol* 1970; 103: 50–52.
- Higgins CC. Ureteral injuries during surgery: a review of 87 cases. *JAMA* 1967; 199:82–88.
- Blandy JP, Badenoch DF, Fowler CG, et al. Early repair of iatrogenic injury to the ureter or bladder after gynecological surgery. *J Urol* 1991;146: 761–5.
- Rao MP, Dwivedi US, Datta B, et al: Post-cesarean vesico-uterine fistula – Youssef's syndrome: our experience and review of published work. *ANZ J Surg* 2006; 76: 243–245.
- Karram MM. Lower urinary tract fistulas. In: Walters MD, Karram MM, editors. *Urogynecology and reconstructive pelvic surgery*. 3rd ed. Philadelphia: Mosby Inc; 2007. p. 450–9.
- Jozwik M, Jozwik M: Spontaneous closure of vesicouterine fistula: account for effective hormonal treatment. *Urol Int* 1999; 62: 183–187.
- Mola G, Vangeenderhuysen C. Introduction. In: Lewis G, De BernisL (eds) *Obstetric Fistula: Guiding Principles for Clinical Management and Programme Development*, chapter 1. World Health Organization, Geneva, 2006.
- Pushkar DY, Sumerova NM, Kasyan GR. Management of urethrovaginal fistulae. *Curr Opin Urol*. 2008;18:389-94.
- Webster GD, Sihelnik SA, Stone AR. Urethrovaginal fistula: a review of the surgical management. *J Urol* 1984;132:460–2.

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