



Genitourinary / Fecal Fistulae: Etiology, Types and Surgical Outcomes

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ABSTRACT

Introduction: Genitourinary/ fecal fistula is an abnormal communication between the genital tract and either the urinary tract or the gastrointestinal tract. Among genitourinary fistulae, most common is the vesicovaginal followed by ureterovaginal fistula.

Aims & Objectives: The aim of our study is to determine various causes and types of genitourinary/fecal fistulae and their surgical outcome in our setting.

Place and Duration of Study: A descriptive, retrospective cross-sectional study was conducted at Central Park Teaching Hospital Hospital, Department of Obstetrics and Gynaecology from December 2013-December 2021.

Material & Methods: Total of 77 patients presented with various types of genitourinary/fecal fistulae during the study period. All details as demographic characteristics, type and cause of fistula, route of repair and surgical outcome were taken on a standardized proforma. All data was entered and analyzed in SPSS version 26 for statistical analysis. p-value of less than 0.05 was regarded as significant.

Results: In this study, the age range was from 22 to 62 years with mean age 38.38 + 10.67 years. Mean duration of fistula was computed as 45.47 + 71.31 months with the range of 1 month to 27 years (324 months). Average fistula size was 1.14 + 0.96 cm with the range of 0.25 cm to 3 centimeters. The obstetric causes of fistulae accounted 44% (n=34) while iatrogenic causes were seen in 56% (n=43) of patients. The most common type of fistula was VVF with 53 (69%) patients followed by uretero-vaginal fistula with 08 (10.0%). The least common type of fistula was urethro-vaginal with only 01 (1%) case of 22 years, 05 (7%) patients had RVF and 08 (10%) had vesico-uterine and vesico-cervical fistulae. the overall success rate is 88.3%.

Conclusion: The iatrogenic causes of genitourinary/fecal fistulae are more prevalent than obstetric causes. The successful outcome of fistula repair depends on number of previous attempts of repair and outcome of repair worsen with each number of previous attempts.

Keywords: fistula, genitourinary, surgical outcome, vesico-vaginal (VVF), iatrogenic fistula, rectovaginal fistula(RVF)

INTRODUCTION

World over and mainly in resource constrained countries, millions of young girls and women are living in isolation and get neglected in life because of obstetric fistula¹. In developing world like Pakistan obstructed labour is the major cause of Obstetric fistula². Genitourinary/ fecal fistula is an abnormal communication between the genital tract

(vagina, cervix or uterus) and either the urinary tract (bladder, ureter or urethra) or the gastrointestinal tract (rectum or anal canal)³. According to WHO, globally around 50,000-100,000 new cases of obstetric fistula are added each year⁴. The countries with highest fistula burden are in Sub Saharan Africa and Asia⁵. Approximately 2 million women in developing countries are still waiting for surgical correction of fistula and half of them are from Nigeria⁶. According to secondary data analysis of Pakistan Demographic and health survey 2006-7, around 3% of women who ever had given birth experienced some signs of obstetric fistula and prevalence at the time of survey was 1.1%⁷. Obstetric fistula resulting from ischemic necrosis due to obstructed labour accounts for more than 90% causes of genitourinary fistula⁸. Recently a changing trend in the etiology of genitourinary fistula is observed. Iatrogenic fistula resulting from gynaecological surgeries mainly abdominal hysterectomy and cesarean section (due to indications other than obstructed labour) is now

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increasing. Over a period of 12 years a rising trend in iatrogenic fistula was seen from 43.5% - 71.4%⁹. Among genitourinary fistulae, most common is the vesico-vaginal followed by uretero-vaginal fistula. Other types of fistulae involving uterus (vesico-uterine), (vesico-cervical) cervix and urethra (urethra-vaginal) are least common¹⁰. Vesico-vaginal fistula that is very small and detected soon after delivery or gynaecological surgery can be treated conservatively with continuous bladder catheterization for a period of 2-6 weeks¹¹. Surgical repair can be done either through vaginal route or abdominal route depending on the type and site of fistula¹². The success rate of fistula repair depends on various factors including size, site and type of fistula, general health conditions of the patient, scarring around fistula, and involvement of urethra, previous attempts at repair and the expertise of surgeon¹³. The obstetrical fistula involving urethra leads to poor outcome after surgical repair¹⁴. The aim of our study is to determine various causes and types of genitourinary/fecal fistulae and their surgical outcome in our setting.

MATERIAL AND METHODS

This descriptive, retrospective study was conducted at Central Park Teaching Hospital, Department of Obstetrics and Gynaecology from December 2013-December 2021. Ethical approval (CPMC/IRB-No/1318) was obtained from Institutional Review Board of Central Park Medical College & Teaching Hospital. All the patients with genitourinary/fecal fistula with the age range of 18 to 65 years of age were treated in Central Park Teaching Hospital were included in the study while those patients who were unmarried or had congenital cause of fistula, who had stress incontinence, urinary schistosomiasis, pelvic trauma and irradiation and immune compromising infections like tuberculosis and HIV were excluded from this study. After taking written approval from Medical Superintendent of the hospital, data was retrieved from hospital record. All details including demographic characteristics age, marital status, size of fistula, type of fistula, cause of fistula, route of repair and surgical outcome were taken on a standardized proforma before informed consent was obtained from all study participants. While patients with deficient data were also excluded from study.

Statistical Analysis:

All data was entered in SPSS version 26 for statistical analysis. Mean, median and standard deviation calculated for age, fistula size and duration of fistula while frequency and percentage

calculated for type and etiological pattern and surgical outcome of fistulae. Previous attempts of fistula repair and outcome of subsequent repair at our set-up was cross tabbed and fisher exact test was employed. A p-value of less than 0.05 was regarded as significant.

RESULTS

In this study, a total of 77 women age ranging from 22 to 62 years with mean age 38.38 ± 10.67 were recruited with the history of fistula followed by repair. Mean duration of fistula was computed as 45.47 ± 71.31 months with the range of 1 month to 27 years (324 months). Average fistula size was 1.14 ± 0.96 cm with the range of 0.25 cm to 3 centimeters. Major causes of fistula were; iatrogenic trans-abdominal hysterectomy (n=31), obstetric (obstructed labour) NVD (n=18) and LSCS for obstructed labour (n=10) and other causes were forceps delivery (obstetric fistula) (n=6), cesarean other than obstructed labour (n=6), iatrogenic D & C (n=4), difficult enema (n=1) and supra-levator hematoma (n=1). Common types of fistulae were noted and it was found that vesico-vaginal fistula (VVF) (69%, n=53) is the most common type followed by uretero-vaginal fistula (10%, n=8) in our study population as explained in Fig-1.

Major causes of fistula were defined as obstetric (n=34) and iatrogenic (n=43) and were categorized into sub causes. It was found that NVD followed by obstructed labour (n=18) is the leading obstetric cause of fistula formation in females resulting in most common type of fistula formation i.e. vesico-vaginal fistula (83.33%, n=15) as explained in Table-1. The most common fistula type after forceps delivery was rectovaginal fistula (n=2, 50%) when compared with other types (p-value =0.001) by employing Chi-square Test. Similarly, LSCS for obstructed labour also resulted in VVF (90%, n=9) as explained in Table-1 and Fig-1. In iatrogenic causes of fistulae (n=43), abdominal hysterectomy (n=31) was the leading cause of fistula. In abdominal hysterectomy, most common type of fistula was vesico-vaginal fistula (83.87, n=26) with Chi-square p-value of 0.028 suggestive of usual fistula in abdominal hysterectomy would be VVF. Interestingly C-section can lead to VVF (33.33%, n=2), uretero-vaginal fistula (33.33%, n=2) and vesico-uterine fistula (33.33%, n=2) with the p value of 0.017. Most common fistula in patients of D & C was vesico-cervical fistula as explained in Table-2.

In this study, it was also noted that previous attempts of repair have a role in the final outcome of

surgery. As in those patients who had no previous history of repair (n=58) and amongst those 95% (n=55) had successful outcome while in those patients who had previous attempts of repair (n=19), only 68.4% (n=13) had successful outcome and 31.6 % (n=6) of cases had failed attempt of repair with the p-value of 0.006 suggestive of previous attempts of repair can lead to failure in subsequent attempts of repair.

Routes of repair of fistula i.e. vaginal, abdominal, abdomino-perineal and cystoscopy were compared in various etiologies of fistula. It was noted that regardless of cause, vaginal route was most common route of repair in majority of etiologies with p-value of 0.008 as explained in Table-3. In fistulas that resulted during c-sections other than obstructed labour, abdominal route was most common route of repair (83.33%) and also in cases that resulted due to supra-levator hematoma. On application of Pearson correlation, no significant correlation between size of fistula and duration of fistula was found were p value of -0.084 and p-value of 0.467

Major Causes	Sub Causes	Types of fistulae	N (%)	P-value
Obstetric (n=34)	NVD followed by obstructed labour (n=18)	VVF	15 (83.33)	0.329
		RVF	1 (5.56)	
		Vesico-cervical	2 (11.11)	
	Forceps delivery (n=6)	RVF	3 (50)	0.001
		Combined	2 (33.33)	
		Urethro-vaginal	1 (16.67)	
LSCS for obstructed labour (n=10)	VVF	9 (90)	0.646	
	Vesico-uterine Fistula	1 (10)		
Iatrogenic (n=43)	cesarean other than obstructed labor (n=6)	VVF	2 (33.33)	0.017
		Uretero-vaginal Fistula	2 (33.33)	
		Vesico-uterine Fistula	2 (33.33)	
	TAH (n=31)	VVF	26 (83.87)	0.028
		Uretero-vaginal Fistula	5 (16.13)	
	D&C (n=4)	VVF	1 (25)	0.001
		Vesico-uterine Fistula	1 (25)	
		Vesico-cervical	2 (50)	
	difficult enema (n=1)	RVF rectovaginal fistula	1, (100)	0.024
	Supra-levator hematoma (n=1)	Ureterovaginal Fistula	1, (100)	0.189

Table-1: Assessment of types of fistulae in obstetric and iatrogenic causes.

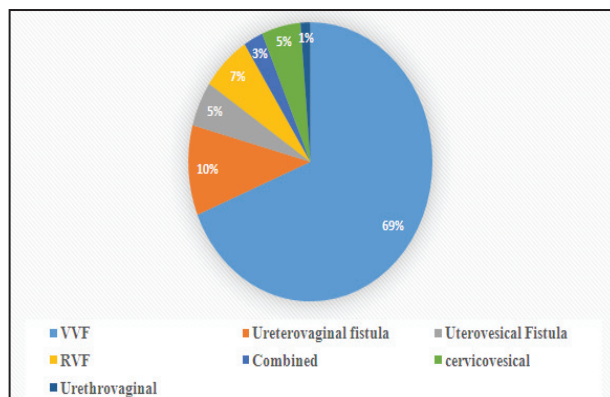


Fig-1: Types of Fistulae in Pakistani females.

Previous Repair	Outcome Of First Attempt At Our Set-Up		Total	Fisher's Exact Test P-Value
	Failed	Successful		
No	03 (5%)	55 (95%)	58 (100%)	0.006
Yes	06 (31.6%)	13 (68.4%)	19 (100%)	
Total	09 (11.70%)	68 (88.30%)	77 (100%)	

Table-2: Crosstab of outcome of repair and any previous attempt.

Causes Of Fistula (n)	Route Of Repair N, (%)				P-Value
	Vaginal	Abdominal	Abdomino-perineal	Cystoscopy	
obstetric, NVD (18)	15 (83.33)	3 (16.67%)	0 (0%)	0 (0%)	0.008
Obstetric forceps (6)	4 (66.67 %)	0 (0%)	2 (33.33)	0 (0%)	
LSCS for obstructed labour (10)	5 (50%)	5 (50%)	0 (0%)	0 (0%)	
cesarean other than obstructed labor (6)	1 (16.67 %)	5 (83.33%)	0 (0%)	0 (0%)	
Iatrogenic, TAH (31)	18 (58.06 %)	12 (38.70%)	0 (0%)	1 (3.24 %)	
iatrogenic, D&C (4)	2 (50%)	2 (50%)	0 (0%)	0 (0%)	
difficult enema (1)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	
supralevator hematoma (1)	0 (0%)	1 (100%)	0 (0%)	0 (0%)	

Table-3: Comparison of routes of fistula repair with various etiologies.

DISCUSSION

Genitourinary fecal fistula is the most crippling complication of childbirth and gynaecological procedures. Substandard care during labour leading to obstructed labour is the most common cause of vesico-vaginal fistula in underprivileged areas of the

world such as most parts of Africa and Asia and accounts for more than 90% of the causes of fistula. Whereas in developed countries radiation and gynaecological surgery are the most prevalent causes for vesico-vaginal fistula formation¹⁵. Recently a changing trend in the etiology of genitourinary fistula formation is observed. In our study, the frequency of genitourinary fistula due to obstructed labour was 44%, whereas it was 56% due to iatrogenic causes. We saw iatrogenic causes accounting for more than obstetric reasons. Similar results were shown in another tertiary care hospitals of Pakistan. In a study done in Lahore iatrogenic fistula was accounting for 54% and obstructed labour as 46%¹⁶. In Faisalabad more than half of the cases of genital fistula were due to iatrogenic causes¹⁷. In Hyderabad 48% of cases were due to obstructed labour and remaining 52% were due to iatrogenic causes including abdominal hysterectomy and other causes not related to obstructed labour¹⁸. In Islamabad a study presented 12 years data of genitourinary fistula from a tertiary care hospital showed 58% cases related to iatrogenic causes and 42% due to obstructed labour⁹. The same study showed a rising trend of iatrogenic fistula from 43.2% in 2006 to 71.4 % in 2018. This changing trend in the etiology of genital fistula was also observed in Nepal, where an annual increasing rate of iatrogenic fistula repair from 3-23% was observed over 5 years¹⁹. A study done in India depicted obstetric trauma in 56% of patients and iatrogenic fistula as 39%. The increasing rate of iatrogenic fistula formation in Pakistan is alarming. It points towards lack of standard surgical skills. It must raise awareness at the Ministry of Health to find and eliminate the root cause. The mean age of patient in our study was 25.5 years. About half of the cases are under the age of 35 years. The mean age in other studies was around 30 years^{9,18}. This shows that majority of patients developed this condition in a young age and if not treated adequately will compel them to spend almost half of their life in this misery.

In our study the most common type was vesico-vaginal fistula accounting for 68.8%. Other studies showed similar findings. Vesico-vaginal fistula was the most common type among all genitourinary fistulae accounting for 64-78% in various studies^{20,21,22}. In our study the second most common type was uretero-vaginal fistula accounting for 10% of all varieties. Similar incidence was found in other study²⁰. Priyadarshi et al. quoted the frequency of uretero-vaginal fistula as 14%²¹.

In our study vaginal route of repair was adopted in 46 (59.74%) cases and 28 (36.6%) had abdominal

route of repair. Out of VVF 69% were approached through vaginal route and 31% through abdominal route. Priya darshi et al, quoted vaginal route of repair for VVF as 51%²¹. In a study done in Hyderabad 92% of vesico-vaginal fistula were approached through vaginal route¹⁸. Raashid Y et al, adopted vaginal route in 87% of cases while 13% were approached through abdominal route¹⁶. Vaginal route of repair is preferred because of many reasons that include lesser blood loss, less operating time, simpler anaesthesia, early recovery and less postoperative pain²³. However, if a fistula is very high or there is involvement of ureters that need reimplantation then abdominal route is adopted²⁴.

In our study, the overall success rate for various types of fistulae repair was 88.3% while the success rate of VVF repair was 88.7%. In literature success rate of vesicovaginal fistula repair is seen ranging from 87-92%^{16,18,21}. We had 8 cases of ureterovaginal fistula. Seven out of 8 cases were approached through abdominal route. Out of these 7 cases 6 required ureteric reimplantation and in 1 patient Boari's flap was made. One patient of ureteric fistula was managed by passing DJ stent through cystoscopy and stent was removed after 6 weeks with complete recovery. The success rate of ureteric fistula in our study was 100% which is comparable with other studies as well^{20,25}. In our study, the most common cause of ureteric fistula was abdominal hysterectomy and same finding was seen in other study²⁵. In the current study, 9 patients had failed attempt of repair. Out of these 9 patients, 6 patients had various previous attempts of repair at some other facility before coming to us. Three patients had 4-6 previous failed attempts of repair and 3 patients had one attempt of failed repair previously. Fistula surgery is a delicate procedure and success rate is reduced with each successive attempt. This finding is consistent with other study²². In literature 93% success rate of VVF is seen in patients who did not have any previous attempts of repair²⁶. If we compare the data that we collected from two hospitals, all the patients who presented at Social Security Hospital did not have any previous attempt and they were treated by a single surgeon with a success rate of 95%. In our study, out of 9 patients who remained incontinent had diabetes. Diabetes is one of the factors that can lead to poor tissue healing, infection, and wound breakdown. This factor for failed repair was also seen in another study¹⁷.

CONCLUSION

Genitourinary/fecal fistulae are the preventable cause of maternal morbidity. The high incidence indirectly reflects inadequate health care provision. The recent increase in iatrogenic fistula cases is alarming and should be addressed at a priority. As success rate of repair is reduced with each successive attempt, it is highly advisable that primary fistula repair should be done by trained fistula surgeon.

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