

Original Research Article

Prevalence and Experience with Ureteric Fistula in a Comprehensive Obstetric Fistulae Care Facility in Jos North-Central Nigeria

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Abstract

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Urinary incontinence resulting from genital fistulae has been on the increase for over a decade now due to increased fistula care and treatment awareness and improvement in access to care and treatment coupled with community awareness program in which care and treatment intervention are now made possible close to where the sufferers of fistulae live. A study carried out in our facility in 2007 showed an annual fistulae case of about 300, while we currently diagnose between 400 and 500 cases annually. Besides vesicovaginal fistula (VVF) which is the commonest female genital fistula, ureterovaginal fistula (UVF) appears to also be on the increase. We therefore carried out a review of the diagnosis and surgical outcomes of ureteric fistulae in order to ascertain the proportion of the female genital fistulae that are UVF in order to proffer possible preventive measures. We also determined the surgical success rates of ureteric fistulae cases repaired at Bingham University Teaching Hospital. This retrospective study was conducted between January; 2017 and December; 2022. We reviewed the medical records looking at the final diagnosis of all fistulae cases diagnosed over the period, diagnostic methods and causes of ureteric fistulae, including their follow up data for six months post-surgery. All the data extracted from the patients' medical record were analyzed using IBM SPSS version 26. Over the period of review, 2445 fistulae cases were diagnosed out of which 103 were ureteric fistulae/uretero-vaginal fistula (UVF) giving us a prevalence of 4.2%. The leading aetiological factors were caesarean delivery 74(71.8% of 103), Myomectomy 13 (12.6% of 103) and congenital 9 (8.7% of 103). The surgical success rate was 98.1% both at 3 and 6 months post-surgical repair. From the study, Caesarean delivery is a common procedure in obstetric and delivery practice after vaginal delivery and was responsible for 71.8% of 103 UVF found in our study. Ureterovaginal fistulae have become a worrisome cause of urinary incontinence and the left ureter affected more than the right ureter. The high success rate of 98.1% of 103 cases and less morbidity recorded is a reflection of surgical competency and efficiency of the Fistulae care and treatment team at the centre.

Keywords: Evangel VVF centre, Fistula, North central Nigeria, Ureteric, Uretero-vaginal-fistula

INTRODUCTION

Fistula is an abnormal communication or passage between a hollow or tubular organ and the body surface,

or between two hollow organs. While vesicovaginal fistula refers to abnormal communication between the urinary

bladder and the vagina resulting in continuous or total incontinence, ureterovaginal fistula (UVF) on the other hand is the abnormal opening between the distal ureter and the vagina, the urine therefore bypasses the bladder and directly flows into the vagina (Aarts et al., 2015; Monn and Damm, 2021). The background of those suffering from obstetric fistulae are usually that of poverty, malnutrition and marriage in childhood leading to child bearing before their pelvis are matured and eventual cephalopelvic disproportion (Daru et al., 2011; Lawal et al., 2019; Federal Ministry of Health, 2023). The psychosocial consequences are those of shame, marital disruption, rejection and eventual destitution (Daru et al., 2011; Lawal et al., 2019; Federal Ministry of Health, 2023). The clinical presentation does mimic that of stress incontinence even though the symptoms of UVF is usually more pronounced than the traditional urinary incontinence symptoms (Aarts et al., 2015; Monn and Damm, 2021).

Patients with UVF just like their vesicovaginal fistulae (VVF) counterpart, experience prolonged hospital stay, delayed postoperative recovery time, and persistent urinary incontinence (Burivong et al., 2011). They also experience increasing distress occasioned by morbidities associated with UVF/VVF and inability to shoulder the cost of surgery and possible repeat surgery with their usual poor background. Their emotional wellbeing is also affected as the situation continues to impact on their quality of life (Murtaza et al., 2012).

The incidences of UVF have been put at between 0.2 and 1.2% during abdominal or pelvic surgeries (Purandare, 2007; Park et al., 2012).

In developed countries the commonest cause of UVF is over 50% of the cases is hysterectomy for conditions like uterine myoma, menstrual dysfunction and uterine prolapse, whereas in developing countries the situation is different (Monn and Damm, 2021; Randawa et al., 2009). In Nigeria caesarean delivery modalities is responsible for 38% of cases while caesarean hysterectomy is responsible for UVFs in 25% of the cases of UVF (Randawa et al., 2009).

The factor responsible for this mostly iatrogenic creation is the proximity of the ureters to the uterus and cervix usually adjacent to the uterine vessels and injuries occur during ligation, crushing, transection, resection and devascularization procedures (Randawa et al., 2009). Even intra-operative diagnostic cystoscopy have also been noted to increase the occurrence of ureteral injuries (Ibeanu et al., 2009; Gilmour et al., 2006). The left ureter is usually more prone to the iatrogenic injury (Obarisiagbon et al., 2011; Nnabugwu and Amu, 2010). Ureterovaginal Fistula can be diagnosed in the following ways (Raassen et al., 2017):

1. Obtaining history of the patient leaking urine and still passing urine normally. This is because the patient is leaking urine from the affected ureter into the vagina

while the unaffected ureter still drains normally into the bladder and thus normal micturition still occurs via the urethra. Hence the patient is wet all the time but still voids urine normally. One should therefore enquire about previous surgery that may be responsible for this confusing history.

2. During examination of the patient in which case one obtains a negative dye test with clear urine being seen at the vagina giving strong suspicion of UVF. Before this examination, the patient should be made to drink a lot of fluid orally. The initial suspicion is that of vaginal discharge.

3. The diagnosis of UVF can be established by laboratory investigations such as intravenous urography, retrograde ureteropyelography, and ultrasonography. These procedures can reveal various degrees of hydronephrosis and hydroureter. In 95% of cases ultrasonography is sufficient to diagnose UVF with the presence of hydronephrosis. However, the flow of urine into the bladder from the affected side and leakage of urine into the vagina and absent hydronephrosis diagnosing UVF becomes difficult in 5% of cases. For the 5% of cases hydronephrosis can become obvious by making the patient drink a lot of fluid before embarking on the investigation.

Where suspicion of UVF exists diagnosis can be accomplished via intra-operative cystoscopy paving the way for repair of the UVF and thus the subsequent ipsilateral kidney compromise is prevented (Ibeanu et al., 2009; Gilmour et al., 2006; Sternschuss, 2012; Yu et al., 2013).

Clinical presentation of UVF is usually that of continuous urinary incontinence following abdominal or pelvic surgery (Yu et al., 2013). However unlike VVF, the patient with UVF still experiences normal voiding. When in doubt, further differentiation clinically of VVF from UVF can be carried out through dye test which is negative in the case of UVF or via the simple three swab test that is able to differentiate UVF from VVF (Randawa et al., 2009). The diagnostic procedure for UVF as already alluded to above is by cystoscopy and intravenous urography (Raassen et al., 2017; Rafique and Arif, 2002).

Surgical management depends on timing of diagnosis, site and nature of injury. When diagnosis is delayed, re-implantation of the affected ureter into the bladder and end-to-end anastomosis are modalities of management whereas intraoperative repair can be carried out immediately without the need for re-implantation when diagnosed intra-operatively (Yu et al., 2013; Rafique and Arif, 2002).

This review was carried out to determine the prevalence of ureteric fistulae in the catchment areas within the Northern regions of Nigeria since the ECWA Evang Fistula Centre located within the Bingham University Teaching Hospital happens to be the largest comprehensive care, treatment, rehabilitation and training

Table 1. Socio Demographic Characteristic

Variables		Frequency	Percent
Age Group	1 _ 10	03	2.91
	11 _ 20	12	11.65
	21 _ 30	31	30.1
	31 _ 40	34	33.01
	41 _ 50	18	17.48
	51 _ 60	04	3.88
	61 _ 70	01	0.97
	Total	103	100
Marital status	Married	78	75.7
	Single	10	9.7
	Separated	05	4.9
	Widowed	06	5.8
	Divorced	04	3.9
	Total	103	100
Tribe	Igbo	01	01
	Yoruba	01	01
	Hausa	65	63.1
	Others	36	35
	Total	103	100
Highest level of formal education	Primary	46	44.7
	Secondary	29	28.2
	Tertiary	05	4.9
	No formal education	23	22.3
	Total	103	100
Major occupation	None	42	40.8
	Farmer	34	33
	Trader	12	11.7
	Student	06	5.8
	Civil Servant	03	2.9
	Artisan	03	2.9
	Others	03	2.9
	Total	103	100

Centre for women suffering from obstetric and other gynaecological fistulae in the Northern hemisphere of Nigeria. We also aimed at assessing our success rate in the management of 103 women with ureterovaginal fistula who had abdominal re-implantation in an Evangel VVF center.

METHODOLOGY

Ethical clearance was obtained from the human health research and ethics committee of Bingham university teaching hospital, Jos, Plateau State Nigeria prior to commencement of the study. The study was a retrospective data collection of ureterovaginal fistulae patients' cases managed in Evangel VVF Centre BhUTH between January; 2017 and December; 2022. The data were extracted from case notes, clinic medical records and theater records. All the women who were recruited into the study were those who went through ureteric fistula repair by transabdominal (TA) approach and subsequently followed-up at 3- and 6-months post-surgery

respectively. The success of the procedure was defined by clinical history, surgical procedure preceding the history of urine leakage, mode of diagnosis, repair and follow up at 3 and 6 months respectively.

All data were entered into spread sheet and IBM SPSS version 26 was used for statistical analysis. Descriptive statistics such as frequency and percentage was employed for the study all through.

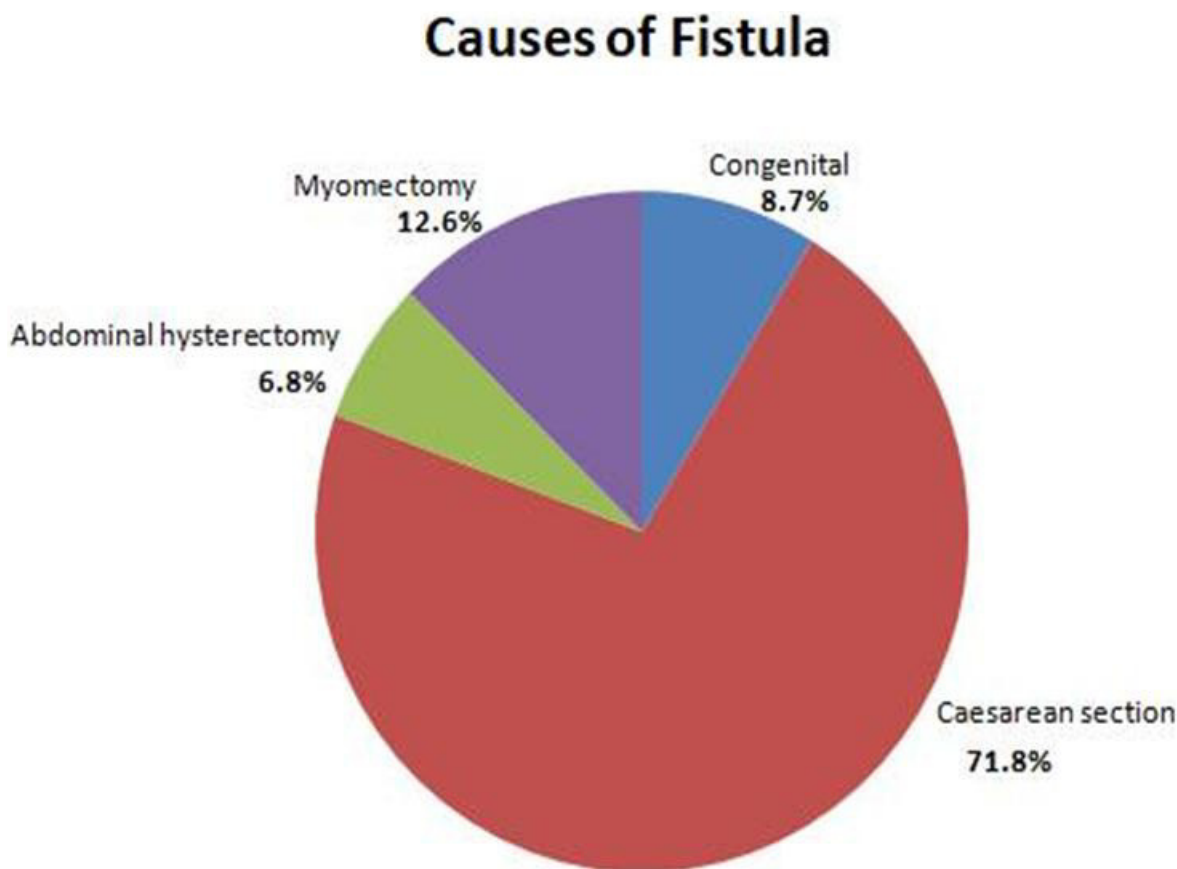
RESULTS

Over the period of review, a total of 2445 fistulae patients were diagnosed and went through fistula surgical repairs. Out of the 2,445 cases 103 patients were diagnosed of uretero-vaginal fistulae and subsequently went through abdominal repair of ureterovaginal fistula, giving us a prevalence of 4.2%. All the 103 (100%) patients had ureteroneocystostomy.

The baseline characteristics are as shown in Table 1. The mean age was 33.24 years (range, 10 to 70 years) Table 1. The mode of diagnosis of vesicovaginal fistulae

Table 2. The Mode of Diagnosis of Ureteric Fistula

Modes	Frequency	Percent
Clinical history and dye test	94	91.3
Intravenous urography	9	8.7
Total	103	100

**Figure 1.** Showing the causes of ureteric fistula**Table 3.** Success Rate at 3months and 6months

Variables		Frequency	Percent
At 3months	No leakage of urine	101	98.1
	Failed repair	2	1.9
	Total	103	100
At 6months	No leakage of urine	101	98.1
	Failed repair	2	1.9
	Total	103	100

were via clinical history and dye test in (93.2% of 2445) and Intravenous urography in 6.8% of the cases where as for ureteric fistulae 94 (91.3% of 103) cases were by clinical history and dye test and 9 (8.7% of 103) were by intravenous urography Table 2. Site of the ureteric fistulae were 1. Left 60 (58.3% of 103), 2. Right 41 (39.8%

of 103)3. Both ureter in 2 cases (1.9% of 103). Majority of the reviewed cases 65 of 103 had midline sub – umbilical incision for Emergency Caesarean delivery. The causes of UVF are as in figure 1.

The success rate at 3 months were 101 (98.1%) of women that did not have leakage of urine post-surgery at

3 months and at 6 months follow up respectively, while 2(1.9%) of women had failed repairs since they had continued to leak urine after surgery at 3 and 6 months follow up respectively table 3.

DISCUSSION

The study highlights the fact that Nigeria contributes significantly to the burden of genital fistulae globally considering the number of fistula surgeries noted within the period of study 2,445 cases in 5 years giving us an average of 489 cases per annum outside of the about 2 million cases living with the condition that are not treated in Sub – Saharan Africa and Asia (WHO, 2023). This is not surprising since Nigeria is in Sub-Saharan Africa that together with Asia has the largest burden of female genital fistulae. Considering the enormous psychosocial consequences – shame and social segregation from continuous leakage of urine/faeces, and the medical morbidities associated with the condition, including the potential for loss of renal function (WHO, 2023); the prevalence rate of 4.2% reported in this study is quite high and a cause for concern. The vast majority of the cases of UVF resulted from caesarean delivery for prolonged obstructed labor 74 cases (71.8% of 103) figure 1. This finding is in sharp contrast to reports from the developed countries where hysterectomy is the commonest cause of ureterovaginal fistula (Burivong et al., 2011; Murtaza et al., 2012; Rafique and Arif, 2002; Ares et al., 2003; Selzman et al., 1995). However caesarean delivery is the main aetiology for UVF in Nigeria as seen in this study and similar to what is obtained in developing world of which Nigeria is a part (Mahendran et al., 2012; Bennani et al., 1996; Ozumba and Attah, 1991). A study carried out in Enugu, South-East Nigeria reported caesarean section (38%) and caesarean hysterectomy (25%) as the leading causes of ureterovaginal fistula (Bennani et al., 1996), while the present study reported caesarean delivery (71.8%), caesarean hysterectomy (6.8%), congenital (8.7%) and Myomectomy (12.6%). The consistent association of this fistula with childbirth is unacceptable and probably reflects the poor standard of care available to some pregnant women in certain areas especially in the rural communities in the country. This association also has the negative potential of further discouraging women from consenting to abdominal delivery if active measures are not taken to improve the quality of care. The diagnosis of ureterovaginal fistula was made clinically in 91.3% of the patients and intravenous urography was employed in a few patients 9 (8.7%).

The anatomical location of the left ureter makes it closer to the cervix compared with the right ureter making it more prone to ureteric injuries (Onuora et al., 1993). Also, the position of the right ureter is almost always

constant and crosses the external iliac artery, whereas the left lies closer to the midline and crosses the common iliac artery. The left ureter is also said to be 1cm shorter than the right (Chan et al., 2003). It has been suggested that this discrepancy in length makes it less mobile and hence more vulnerable to injury while attempting to secure haemostasis when there is haemorrhage from the uterus. Injury to the left ureter may also arise from the fact that most surgeons operate from the patient's right making the left ureter further away from them and thus more exposed to injury.

Majority of the patients in this study had left ureteral injury 60 (58.3% of 103) right ureteral injury 41(39.8% of 103) and bilateral ureteral injury 2 (1.9%of 103). The above figures are consistent with findings from other studies (Obarisiagbon et al., 2011; Nnabugwu and Amu, 2010; Mandal et al., 1990; Raassen et al., 2018; Shitu et al., 2003). Majority of the patients had ureteral injury following the use of a midline sub-umbilical incision (65 of 103). This was an unexpected finding and from literatures the use of Pfannenstiel abdominal incision for emergency caesarean section has been documented to more likely lead to ureteral injury due to its association with difficulty to access intraoperatively (Randawa et al., 2013).

All the patients had ureteroneocystostomy with ureteric stents. They all had delayed repair as a result of late presentation following the primary procedure in other facilities. Primary (immediate) repair is however generally advocated when feasible (Ibeanu et al., 2009; Gilmour et al., 2006; Raassen et al., 2017; Sternschuss, 2012; Mandal et al., 1990). Another management option is preliminary diversion of urine via a percutaneous nephrostomy followed later by delayed repair (Ozumba and Attah, 1991; Daniyan et al., 2020). The trans-abdominal route was used in all cases with minimal complication and the choice of route had more to do with experience and expertise of the surgeons. None of the patients required end-to-end anastomosis of the ureter, Psoas hitch or Boari flap. The post-operative outcomes for the patients were good with 98% continence rate at discharge, three- and six-months' follow-up respectively.

The study is limited by its retrospective nature as a prospective study would have yielded more information than what was available from the medical records. Furthermore, a longer study period involving a greater number of patients would no doubt have improved the applicability of the findings from the study.

CONCLUSION

The prevalence of ureteric fistulae due to caesarean delivery and the burden of Obstetric fistulae is high and urgent attention is needed to curb the ugly menace. This study highlights the fact that excellent outcomes are possible in women with ureterovaginal fistula in

experienced hands. Combined ureteroscopic and fluoroscopic technique to reestablish ureteral integrity is a successful treatment approach. Ureteric stent insertion remains a primary management procedure for ureterovaginal fistula.

RECOMMENDATIONS

1. More emphasis should be laid on preventing this dehumanizing condition.
2. Minimal invasive approach (endoscopic) is recommended from this experience as the first choice in ureteric fistula repairs.
3. Early endoscopic intervention in ureteric fistula will lead to minimal morbidity and discomfort, and less expensive.
4. Where a retrograde approach is impossible, percutaneous nephrostomy (PCN) and stent insertion (later) are recommended approach.
5. Ureteroscopic and placement of Double-J stent though technically challenging is still a viable option when detected early.

Authors' Contribution

Dr. Onubi J – Manuscript writing and editing,
 Dr. Chima AAG – Study conceptualization, manuscript writing and final editing,
 Dr. Esegbe P. – Data analysis, manuscript writing and editing.
 Dr. Lengmang P - Study protocol implementation and data collation.
 Dr. Agyema J. - Study protocol implementation and data collation.

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