

# Ureterovaginal Fistula: Aetiological Factors and Treatment Outcome.

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Received: November 2018

Accepted: November 2018

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## ABSTRACT

**Background:** Ureterovaginal fistula commonly occurs as a result of complication of pelvic surgeries with gynaecologic surgeries accounting for approximately two thirds. It is one of the most feared complications of pelvic surgery. Objectives: This study aims to determine the aetiological factors, role of ultrasound in the confirmation of diagnosis and outcome of surgical repair of ureterovaginal fistula at the National Obstetric Fistula Centre, Katsina (NOFIC). **Methods:** This was a two-year retrospective review of all cases that underwent surgical repair for ureterovaginal fistula at the National Obstetric Fistula Centre Babbar Ruga, Katsina from 1st Jan, 2016 to 31st Dec, 2017. **Result:** A total of 27 patients had surgery for ureterovaginal fistula during the study period. However only 25 case notes were eligible for data entry and analysis. The mean age of the patients was  $29.88 \pm 8.53$  with a modal parity of one. Eighty-eight percent presented with history of leakage of urine per vagina following emergency caesarean section, caesarean hysterectomy in 8%, prolonged obstructed labour in 8% and gynaecological hysterectomy in 4%. The onset of leakage varied from 2 to 10 days with a mean duration of onset of  $5.64 \pm 1.70$ . In addition to the ureterovaginal fistula, 3 had vesicouterine (VUF) fistula and 1 had vesicocervicovaginal (VCF) fistula. The fistula was bilateral in 2 of the patients. The fistulae involved the left ureter in 13 patients and the right ureter in 10. Abdominal ultrasound was the main means of confirmation of diagnosis. Abdominal reimplantation of the ureter was the most common (88%) treatment approach. Majority 88% (22/25) were healed and continent at discharge. **Conclusion:** Emergency caesarean section was found to be commonest aetiological factor and the use of abdominopelvic ultrasound was found to be effective in the confirmation of diagnosis and identifying the affected ureter.

**Keywords:** Ureterovaginal Fistula, Abdominopelvic Ultrasound Scan, Etiological Factors, Outcome.

## INTRODUCTION

Ureterovaginal fistula is a pathological communication between the distal ureter and the vagina. It commonly occurs as a result of complication of pelvic surgeries like genitourinary endoscopic procedures, gynaecological and obstetric surgeries, colorectal and vascular surgeries. Approximately two thirds of all ureteral injuries occur during gynecologic surgeries.<sup>[1]</sup> Accounting for 0.5% to 2.5% of major gynaecological surgical procedures in which abdominal hysterectomy accounts for over half of the total cases seen.<sup>[2-4]</sup> Cesarean section is clearly the most common cause for ureteric injury among the obstetric procedures.<sup>[5]</sup> Reports from Nigeria indicate that caesarean sections and caesarean hysterectomies were the leading causes of ureteric injury leading to ureterovaginal (UVF) fistula being responsible for (38%) and (25%)

of the cases, respectively.<sup>[6]</sup> The occurrence of both vesicovaginal and ureterovaginal fistula at the same time has been described by some authors.<sup>[6-8]</sup>

The intimate relation of pelvic ureter to the female genital tract throughout its course in the pelvis makes ureter more vulnerable to injury during various gynaecological procedures. The frequently encountered sites of ureteric injury leading to UVF are lateral to the uterine vessels, base of the infundibulopelvic ligament, the ureterovesical junction close to the cardinal ligaments, at the point where ureters cross the pelvic brim at the ovarian fossa and at the level of the uterosacral ligament.<sup>[9]</sup>

The most common presenting symptom is the onset of constant urinary incontinence one to four weeks after surgery. The patient can normally micturate in addition to the complaint of continuous leakage of urine. The condition is associated with devastating physical, social and mental consequences; and significantly impacts the quality of life of the affected individuals.<sup>[10,11]</sup> Diagnosis of UVF can be made by combination of history, clinical examination and appropriate radiological studies like intravenous pyelography and retrograde

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utereropylography which are important in order to avoid operative failure. The absence of these required investigative techniques and the low-income status of our patients in our centre necessitated the use of ultrasound as diagnostic tool. Abdominopelvic ultrasound was done for all the patients because it is inexpensive, readily available and equally sensitive in the diagnosis of UVF.

This study aims to determine the aetiological factors, role of ultrasound in the confirmation of diagnosis and outcome of surgical repair of uterovaginal fistula at the National Obstetric Fistula Centre, Katsina (NOFIC).

## MATERIALS AND METHODS

This was a two-year retrospective review of all cases that underwent repair for uterovaginal fistula at the National Obstetric Fistula Centre, Babbar Ruga, Katsina from 1st Jan, 2016 to 31st Dec, 2017. Data was obtained from the patient admission form that is filled for all patients on admission, intra-operatively, post operatively and at discharge. The patient's history, speculum examination to assess the anterior and posterior vaginal walls for any fistulous opening, negative methylene blue dye test and abdominal ultrasonography to evaluate the ureters and kidneys for hydroureter and or hydronephrosis were the primary tools used for diagnosis. All the case notes of the patients that had repair during the stated period were retrieved, data was entered and analysed using SPSS version 22 for frequencies and means. Approval for the study was obtained from the Ethical Committee of the National Obstetric Fistula Centre, Babbar-Ruga, Katsina. Permission to carry out the study was sought from the management of National Obstetric Fistula Centre, Babbar-ruga, Katsina.

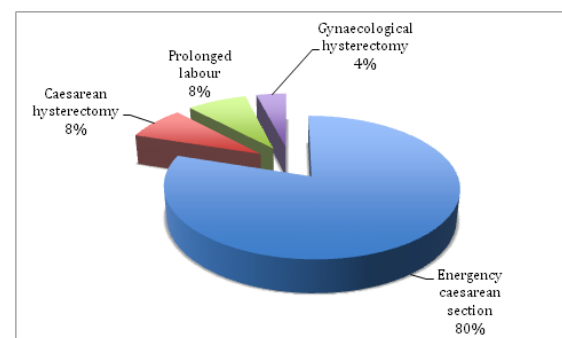
## RESULTS

**Table 1: Socio-demographic characteristics.**

Variable	Frquency (%) n = 25
Age group (years)	
15-24	8 (32)
25-34	9 (36)
35-44	7 (28)
45-54	1 (4)
Parity	
1-2	10 (40)
3-4	2 (8)
5-6	5 (20)
7-8	2 (8)
9-10	3 (12)
11-12	3 (12)
Marital Status	
Married	24 (96)
Divorced	1 (4)
Educational Status	
Not formally educated	23 (92)
Secondary	1 (4)
Tertiary	1 (4)

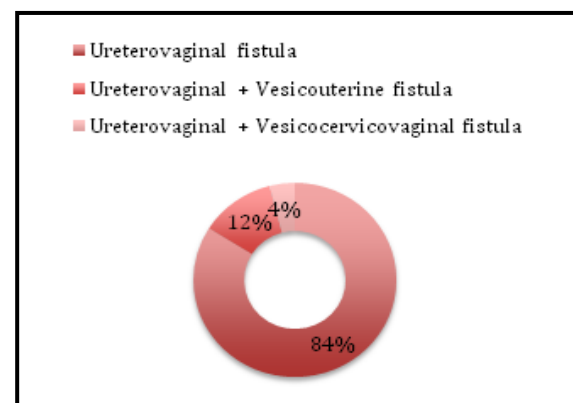
A total of 27 patients had surgery for uterovaginal fistula during the study period. However only 25 case notes were eligible for data entry and analysis. The age of the patients ranged from 18 to 45 with a mean age of  $29.88 \pm 8.53$ . Majority (68%) of the patients were within the 15-34 years age group. Twenty-three of the patients had no formal education. Their parity ranged from 1 to 12 with a modal parity of one. Most (48%) fell within the parity group of 1-2, followed by those that fell in the parity group of 5-6.

Eighty-eight percent presented with history of leakage of urine per vagina following emergency caesarean section, caesarean hysterectomy was reported by 8%, prolonged obstructed labour in 8% and gynaecological hysterectomy in the remaining 4%.



**Figure 1: Aetiological factors**

All the two patients with UVF from prolonged obstructed labour were primipara. The surgical incision of the procedure that leads to the uterovaginal fistula was Pfannensteil and midline in 18 and 5 of the patients respectively. The onset of leakage varied from 2 to 10 days with a mean duration of onset of  $5.64 \pm 1.70$ . Majority 48% started leaking from four to five days after surgery. A diagnosis of uterovaginal fistula only was made in 21 (84%) of the patients. In addition to the uterovaginal fistula, 3 (12%) had vesicouterine (VUF) fistula and 1 (4%) had vesicocervicovaginal (VUVF) fistula.



**Figure 2: Diagnosis**

The fistula involved the ureters bilaterally in 2 of the patients, left ureteric involvement was noted in 13, while the right ureter was injured in 10 of them. All the two with bilateral fistula gave a history of having three previous caesarean sections. Abdominal ultrasound was the means of confirmation of diagnosis following a negative methylene dye test in all the patients. The report showed bilateral hydroureteronephrosis in 3 of the patients, left hydroureteronephrosis in 11 and right hydroureteronephrosis in 10. One of the patients had normal finding on ultrasound in which case a repeat methylene blue dye test was done in the theatre and exploration of both ureters before proceeding with the surgery. Abdominal reimplantation of the ureter was the most common (88%) treatment offered, Boari-flap was done in 8% and reimplantation through the vaginal route was done in one of the patients. Majority of the patients 22 (88%) were dry and continent of urine at discharge, while in 2 (8%) patients the fistula healed but with residual incontinence.

**Table 2: Affected Side, Ultrasound findings, Treatment approach and Repair outcome.**

Variable	Frequency (%)
<b>Affected Ureter</b>	
Left	13 (52)
Right	10 (40)
Bilateral	2 (8)
<b>Ultrasound Findings</b>	
Left hydroureteronephrosis	11 (44)
Right hydroureteronephrosis	10 (40)
Bilateral hydroureteronephrosis	3 (12)
Normal study	1 (4%)
<b>Treatment approach</b>	
Abdominal reimplantation	22 (88)
Boari-flap	2 (8)
Reimplantation through vaginal route	1 (4)
<b>Outcome of repair</b>	
Healed and continent	22 (88)
Healed with residual incontinence	2 (8)
Healed UVF with residual VCVF	1 (4)

## DISCUSSION

A total of 573 genitourinary fistula surgeries were carried out in the centre out of which 27 were for ureterovaginal fistula, giving a prevalence rate of 4.7% which is higher than the generally reported rate of 0.2% - 2.5% for major gynaecological operations.<sup>[2-4]</sup> This confirms the report from Nigeria that reported caesarean section and caesarean hysterectomy as the leading causes of UVF. The finding of UVF from prolonged obstructed labour is rare. However, two patients were found to have developed UVF following extensive tissue necrosis from prolonged obstructed labour. Lengman et al reported a case of UVF from obstructed labour in a primigravida.<sup>[12]</sup> The finding of Pfannensteil incision scar in 18 of the patients may suggest the possibility of poor access, difficult dissection or excessive

bleeding that may obscure the surgeons vision leading to ligation or cutting of the ureters that may manifest later as UVF. The ureteric fistula was found to be bilateral in two of the patients who also gave a history of three previous caesarean sections. The development of bilateral UVF in these patients may be as a result of difficult dissection following severe pelvic adhesion from the previous surgery. The most common presenting symptom is the onset of constant urinary incontinence one to four weeks after surgery in the presence of normal act of micturition.<sup>[11]</sup> In this study the onset of leakage varied from two to ten days with a mean onset at  $5.64 \pm 1.70$ . With good history, physical examination and appropriate radiological studies most of the UVF can be diagnosed and confirmed. The diagnosis of UVF was made and confirmed in this study using good history, physical examination and abdominopelvic ultrasound. There was no need of using the three-swab test. This confirmed the effectiveness of using ultrasound in low resource settings in the confirmation of UVF as reported by Lengman et al,<sup>[12]</sup> and Randawa et al in Zaria.<sup>[13]</sup> In just one patient the ultrasound report showed normal study but the methylene blue dye test was negative with pooling of clear fluid in the posterior vaginal fornix. The patient had laparotomy and the affected ureter was identified and reimplanted into the bladder as recommended by Raassen et al.<sup>[14]</sup> Abdominal reimplantation of the ureter was the commonest treatment approach in this study as equally reported by Raassen et al.<sup>[14]</sup> Overall the treatment outcome was good with 22 of the patients becoming dry and continent.

## CONCLUSION

The prevalence of UVF found in this study 4.7% was high. Emergency caesarean section was found to be commonest aetiological factor and the use of abdominopelvic ultrasound was found to be effective in the confirmation of diagnosis and identifying the affected ureter.

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**How to cite this article:** Nasir S, Ujudud MM, El-ladan AM, Salisu S, Hassan M. Ureterovaginal Fistula: Aetiological Factors and Treatment Outcome. *Ann. Int. Med. Den. Res.* 2019; 5(1):OG01-OG04.

**Source of Support:** Nil, **Conflict of Interest:** None declared