



Research Article

Ureteric injuries associated with hysterectomy: A five-year experience in treating seventeen ureteric units in nine patients

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ABSTRACT

Objective: Ureteric injuries following pelvic surgeries have been widely reported. It often causes severe morbidity and even mortality. It is generally agreed that the true incidence is difficult to determine as only patients who become symptomatic may present for intervention. The aim of this article was to document our 5-year experience in managing patients with post-hysterectomy ureteric injury.

Materials and Methods: A retrospective review of all patients with ureteric injuries following hysterectomy managed at public and private hospitals between 2008 and 2013 was undertaken.

Results: Seventeen injuries occurred in nine patients within the study period; eight patients sustained bilateral injuries. Ureteric ligation and transections were the most common. The left ureter was more commonly injured (58.8%) than the right. Ureteroneocystostomy was the most common method for treating injuries in the distal 2.5 cm of the ureter in this study. A mortality rate of 33.3% was recorded while all the other six patients had a favorable outcome.

Conclusion: Early recognition and treatment guarantee a good outcome in the management of ureteric injuries.

Keywords: Ureteric injuries, Hysterectomy, Management, Outcome

INTRODUCTION

Ureteric injuries have become an increasing cause of disability and litigation.^[1] The ureters are always at risk in the event of any pelvic surgery including hysterectomy either through the abdominal or vaginal route.^[2-4] This is as a result of the close anatomic relationship of the female genital tract with the urinary tract. The risk of injury is further increased when the normal anatomy is altered by pelvic pathology, previous surgery, or adverse intraoperative events such as hemorrhage. A combination of these factors has a multiplier effect on the risk of injury.^[3]

Ureteric injuries have an estimated reported rate of between 0.03% and 1.5%,^[2-4] although it is generally agreed that the true incidence is difficult to determine. This is because only patients who become symptomatic may present for intervention while injury in some patients may never be noted until years later.^[5,6]

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MATERIALS AND METHODS

All patients with post-hysterectomy ureteric injuries managed at Benue State University Teaching Hospital, Federal Medical Centre and a private hospital in Makurdi, Benue State, between 2008 and 2013 were reviewed. Data were collated from the patient's folders and analyzed using the SPSS for Windows, Version 16.0. Chicago, SPSS Inc.

RESULTS

A total of seventeen injuries were documented in nine patients. The patients' ages ranged from 30 to 60 years, with an average of 45 years.

Eight patients had bilateral ureteric injuries while one had a left ureteric injury with ureterovaginal fistula. Ureteric ligation was noted in 10 (58.8%) ureteric units while 35.2% (6) were transected. One ureter was lacerated [Figure 1]. More than half (58.8%) of injuries were on the left ureter while 41.2% of injuries were on the right.

The indications for total abdominal hysterectomy were cancer of the cervix in five (55.5%) patients, dysfunctional

uterine bleeding, post-cesarean section hemorrhage, and uterine fibroids in two patients (22.2%) each [Table 1].

Time of recognition of injury ranged from on table to 2 weeks. The patient with bilateral transection was recognized on table while the one with bilateral ligation presented 2 weeks past hysterectomy.

Anuria was the most common form of presentation in all six patients (66.6%) with bilateral injuries in different combinations [Table 1]. Two patients (22.2%) with ureterovaginal fistulas presented with continuous incontinence associated with normal voiding at intervals. One patient had a burst abdomen at presentation while urinary ascites was noted in three patients (33.3%) who had transection of the ureter. One patient with the left ligation and right transection presented in shock with urinary ascites for which she had ultrasound-guided catheter drainage, but died while awaiting dialysis.

All patients except the one diagnosed on table had abdominopelvic ultrasonography. Urinary ascites was noted in three patients with ureteric transection with normal-sized kidneys noted on the ipsilateral side. Patients with ureteric ligation exhibited various grades of hydronephrosis on ultrasound.

The findings at surgery were bilateral ligation 2.5 cm from the ureterovesical junction in two patients who had bilateral ureteroneocystostomy with psoas hitch. In three patients (33:3%) with the right transection and left ligation, respectively, (six ureteric units) bilateral ureteroneocystostomy were done [Table 2]. In one patient with the right transection in the middle third and left ureteric laceration, a right tube ureterostomy and stenting of the left ureter were done. She subsequently had a Boari-flap repair 6 weeks after. There were two mortalities in the first 48 h of presentation while awaiting dialysis.

One patient with bilateral transection diagnosed on table had bilateral ureteroneocystostomy over ureteric stents. The other six patients were evaluated with abdominopelvic

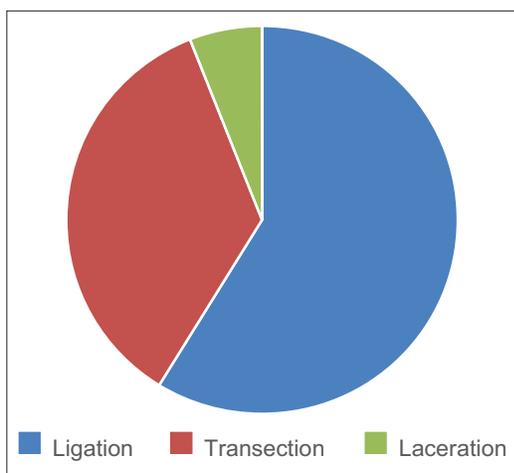


Figure 1: Nature of ureteric injury.

Table 1: Patient overview.

No.	Age years	Parity	Indication for TAH	Time of presentation	Previous surgery	Nature of injury	Main presenting symptom
1	60	6 ⁺¹	Ca cervix	2 weeks	-	Bilateral ligation	Anuria
2	50	5 ⁺⁰	DUB	On table	-	Bilateral transection	
3	55	7 ⁺²	Ca cervix	2 days	CS ovarian cystectomy	R transection L ligation	Anuria
4	42	5 ⁺¹	Uterine fibroid	2 days	-	R transection L ligation	Urinary ascites+anuria
5	38	3 ⁺⁰	DUB	5 days	CS	L Ligation R transection	Urinary ascites+anuria
6	40	6 ⁺⁰	Ca cervix	8 days	-	Bilateral ligation	Anuria+burst abdomen
7	30	6 ⁺⁰	Ca cervix	5 days	-	R transection L laceration	UV fistula
8	40	3 ⁺¹	Ca cervix	2 weeks	-	L ligation	UV fistula
9	50	5 ⁺¹	Ca cervix	2 days	-	Bilateral ligation	Anuria

TAH: Total abdominal hysterectomy, Ca cervix: Cancer of the cervix, DUB: Dysfunctional uterine bleeding, CS: Caesarean section, R: Right, L: Left, UV fistula: Ureterovaginal fistula

Table 2: Operation done versus nature of injury.

No.	Nature of injury	Ureteric unit number (%)	Number of patients	Operation done
1	Bilateral ligation	2 (11.7)	1	Bilateral ureteroneocystostomy+psoas hitch
2	Bilateral transection	2 (11.7)	1	Bilateral ureteroneocystostomy
2	Bilateral ligation	2 (11.7)	1	Nil
3	R transection+L ligation	6 (35.3)	3	Bilateral ureteroneocystostomy
4	R transection+L ligation	2 (11.7)	1	Nil
5	R transection+L laceration	2 (11.7)	1	R tube ureterostomy+L ureteric stenting
6	L ligation	1 (5.8)	1	Ureteroneocystostomy
Total		17 (100)	9	

ultrasonography, intravenous urography, urea electrolytes and creatinine, and hematological workup after initial resuscitation and stabilization.

In terms of outcome, there were three (33.3%) mortalities while six (66.6%) of patients had a good outcome with normal intravenous urography at 3 months of follow-up.

DISCUSSION

Iatrogenic ureteric injuries are known complications of hysterectomy and other pelvic surgeries with attendant morbidity and even mortality, with reported rates varying widely from 0.03% to 1.5%.^[2-4] Aghaji *et al.* reported that open gynecological operations still remain the leading cause in Nigeria.^[7] While endourological procedures have been reported as the leading cause in the USA,^[8] Bennani *et al.*^[9] reported treating twenty-nine injuries in 17 years compared with the seventeen injuries in 5 years in this series. The numbers noted in the present study may be as a result of the fact that the institutions of the study serve as referral centers to a large catchment area.

The previous surgeries and intraoperative bleeding tend to increase the risk of injury^[2,6,10] although only two patients (22.2%) in this series had previous surgeries, intraoperative hemorrhage could not be assessed in this category of patients as the operations were done in peripheral clinics before referral except for the one diagnosed on table. Injuries could range from ligation, transection, crushing, and lacerations.

Ureteric ligation was the commonest in this study (53.3%) as opposed to ureteric transection, which was the most common in other reports.^[11] According to Oboro *et al.*^[11] and Awojobi *et al.*^[12] bilateral ureteric injury is a rare complication of hysterectomy; this is in contrast with the eight patients (88.8%) in this series.

The longest time to present in our series was 2 weeks, unlike the 33 days delay in a bilaterally obstructed patient who had a full renal recovery as reported by Awojobi *et al.*^[12] It is well established that the time taken to recognize the injury is the most important morbidity related factor.^[13,14]

Treatment of distal ureteric injuries depends on the nature of the injury and the time of recognition of the injury. While a deligature may suffice for accidental ligature detected on table, it will not be appropriate treatment when a ureterovaginal fistula develops following delayed presentation as seen in this series hence the ureteroneocystostomy was done. Other treatment options include ureteroneocystostomy, as was used in eleven ureteric units as a result of multiple ligatures, crushing, and late presentation.

To prevent ureteric injuries during gynecological procedures, several suggestions including prophylactic stenting of the ureters have been described, although this does not predict injury, it aids early recognition and hence an improved outcome.^[15] Intravenous urography will outline ureteric anatomy before undertaking a pelvic surgery but interestingly none of the patients in this series had intravenous urography before the primary surgery leading to the injury. The presence of a large pelvic mass or previous surgery should be regarded as red flags for anticipated difficult surgery due to distorted anatomy.

There is a mortality rate of 33.3% while there was no mortality recorded in the series of 12 injuries in 10 years by Oboro *et al.*^[11]

CONCLUSION

Ureteric injuries remain a worrisome complication of abdominal hysterectomy. Distorted anatomies from previous surgeries and large pelvic masses as well as intraoperative hemorrhage are known contributory factors to injury. Early recognition and treatment guarantee a good outcome. Measures to aid prevention and early recognition are recommended.

Declaration of patient consent

Patient's consent not required as patients identity is not disclosed or compromised.

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Conflicts of interest

There are no conflicts of interest.

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