



■ Case Report

Bilateral Ureteric Injury: Its Presentation, Management and Outcomes. A Case Report.

¹Peter Olalekan Odeyemi (docpeto4all@yahoo.com; ORCID ID. 0000-0003-4239-9534), ²Is'haq Ishola Aremu. (iiaremu10@gmail.com; ORCID ID. 0000-0003-3485-3346), ³Musa Ayinde. (musaayinde150@gmail.com; ORCID ID. 0000-0002-1289-7447), Olusola Oyewole Oladosu (oladosudoc@gmail.com; ORCID ID. 0009-0002-5939-3112), ¹Najeem Adedamola Idowu. (idowunajeem0@gmail.com; ORCID ID. 0000-0003-4231-7703.), ⁵Ibukun Adewumi Okunade (ibukunokunade70@gmail.com; ORCID ID. 0009-0003-0252-5564)

¹Division of urology, Department of Surgery, Ladoke Akintola University of Technology Teaching Hospital, Ogbomosho; ²Department of Surgery, General Hospital Ilorin, Nigeria.; ³Department of Obstetrics and Gynaecology, General Hospital Ilorin, Nigeria; ⁴Department of Anaesthesia, General Hospital Ilorin, Nigeria; ⁵Department of Family medicine, Bowen University Teaching Hospital, Ogbomosho , Nigeria.

ABSTRACT

Background: Iatrogenic ureteric injury is a common complication of pelvic surgery especially gynaecological procedures. However, bilateral ureteric injury is very rare with significant morbidity and occasional mortality. Total abdominal hysterectomy is responsible for most cases in our environment especially when performed by non-specialist medical professionals. While literature is sparse on the presentation, management and outcomes of this rare condition, the few ones available do not give a clear guideline.

CASE SUMMARY. A 48-year-old woman with 2 days history of not passing urine through the urethral catheter following abdominal hysterectomy by a general practitioner. Indication for the surgery was a symptomatic fibroid. There was associated progressive abdominal distension. Significant findings on examination were non draining 18Fr foley's urethral catheter, lower abdominal midline surgical wound, significant abdominal distension with vague tenderness. Serial electrolyte, urea and creatinine showed significant progressive deterioration of the renal functions. Ultrasound showed bilateral hydronephrosis with significant intraperitoneal fluid collection. Patient had emergency exploratory laparotomy with intra operative findings of 2.5L of intraperitoneal urine collection, dilated ureters, bilateral suture ligation of distal ureters with leakage of urine around suture lines. Patient had drainage of intraperitoneal collection, bilateral ureteroneocystostomy, bilateral ureteric stenting, peritoneal lavage and was placed on continuous bladder drainage.

CONCLUSIONS: Bilateral ureteric Injury is a urological emergence especially when the patient is rendered anephric by bilateral ureteric ligation. Prompt diagnosis and treatment are important to salvage the renal functions and achieve good outcomes.

Key words; Ureter, Ureteroneocystostomy stent. Hysterectomy , Renal functions

Correspondence

Dr Peter Olalekan
ODEYEMI
Division of Urology,
Department of Surgery,
Ladoke Akintola
University of Technology
Teaching Hospital,
Ogbomosho, Nigeria.
docpeto4all@yahoo.com

INTRODUCTION

Iatrogenic injuries bring to mind the Latin phrase *primum non nocere* meaning 'first do no harm'. When clinicians inadvertently injure the ureters they violate this basic principle.¹ Injury to the ureter is one of the most serious complications of any abdominal or pelvic procedure whether from gynaecological, urological or general surgical disease with concern about the medico-legal implication.² The incidence varies between 0.5 and 10% in most series.³⁻⁵ Traditionally, gynaecological procedures have been reported to account for between 50 and 75% of iatrogenic ureteric injuries (IUI) with hysterectomy accounting for majority of the cases.⁶ Since the ureter lies very near the female reproductive organs throughout its course from the pelvic brim to the bladder, gynaecological or pelvic disease can involve the ureter directly or can cause the course of the ureter to deviate. The normal anatomic relations of the ureter in the pelvis can also vary, thereby making it vulnerable to injury.⁷⁻¹⁰

In Sub-Saharan Africa, with an endemic scarcity of gynaecologists, the practice of major gynaecological surgical procedures is not limited to the specialists alone but also inexperienced non-specialists.^{5,11} Ureteric injury may result from such practices and if not properly managed could lead to increase in morbidity and mortality.^{5,11} Injuries may however be almost unavoidable in some situations, even in the hands of the most skilled and experienced gynaecologists. Though bilateral ureteric injuries are rare, it presents a considerable reconstructive challenge.^{12,13} Injuries recognised during the initial surgery are generally straightforward to treat involving immediate open repair over a ureteric stent.

The management of injuries presenting in the postoperative period has evolved over the past decade changing from a predominantly open approach to endourological retrograde or antegrade stent placement.^{4,12} In addition to the ureteric injury it must not be forgotten that pelvic surgery such as radical hysterectomy can affect lower urinary tract function, typically by injury to the pelvic nerves, resulting in a proportion of women experiencing long-term bladder dysfunction.¹⁴ Issues surrounding the management of bilateral ureteric injury are more complex and are less considered in the literature despite the challenging reconstructive problem that they present. The standard methods of surgical management used for unilateral injury may need to be modified or used in combination for cases of bilateral injury and close observation is needed to minimise further loss of renal function and to avoid uro-sepsis.¹

Objective: To present a case of bilateral ureteric injury, its presentation, diagnosis, management and outcomes.

CASE PRESENTATION

A 48-year-old woman with 2 days history of not passing urine through the urethral catheter following abdominal hysterectomy by a general practitioner. Indication for the surgery was a symptomatic fibroid. There was associated progressive abdominal distension which became worse when kidneys were challenged with IVF and IV frusemide. There was difficulty in breathing presumably due to splitting of the diaphragm. Significant findings on examination were non draining 18Fr foley's urethral catheter, lower abdominal midline surgical wound, significant abdominal distension with vague tenderness. There was also shallow respiratory and tachypnea. Paracentesis done in the accident and emergency yielded free flowing clear fluid presumable to be urine. Full blood count showed anaemia despite two units of blood transfusion from the referral centre. Serial electrolyte, urea and creatinine showed significant progressive deterioration of the renal functions. Ultrasound showed bilateral hydronephrosis with significant intraperitoneal fluid collection.

Patient had emergency exploratory laparotomy by a urologist with intra operative findings of 2.5L of intraperitoneal urine collection, dilated ureters, bilateral suture ligation of distal ureters with leakage of urine around suture lines. Fig 1. Patient had drainage of intraperitoneal collection, bilateral ureteroneocystostomy, bilateral ureteric stenting, peritoneal lavage and was placed on continuous bladder

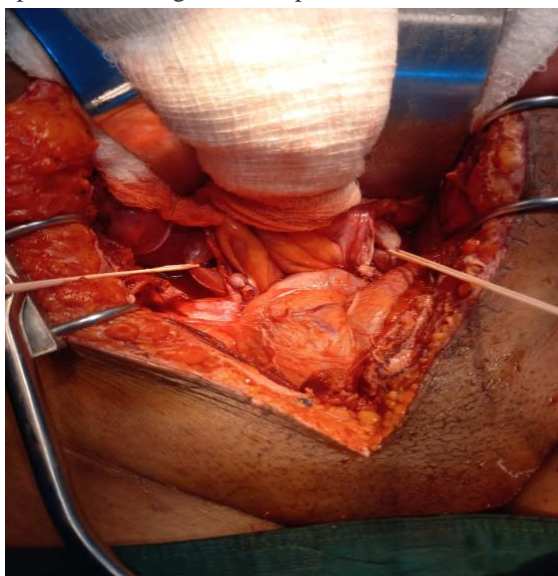


Fig 1. Ligated ureters with leakage of urine

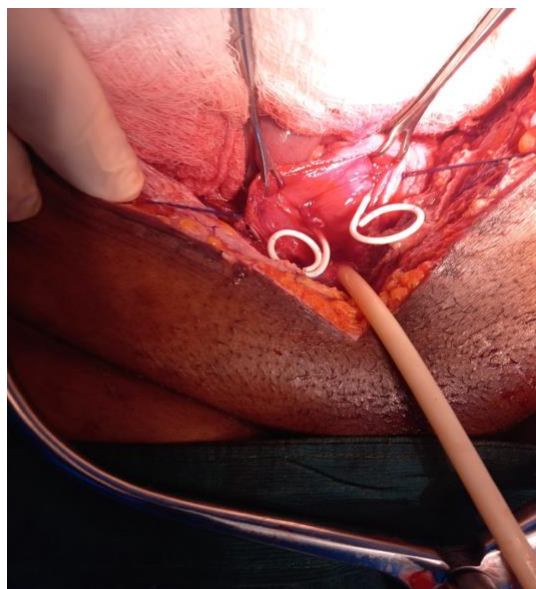


Fig.2. Ureteroneocystostomy with Stenting

Outcomes

Patient had significant improvements post operatively with stable vital signs. Renal functions returned to normal within 48 hours after surgery. Tables 1 and 2. She was subsequently discharged 4 days post op and had ureteric stents removed six weeks postoperative.

RESULTS

Table 1. Post Ureteric Injury EnU, Cr

Day	Cr	Ur	Na	K	Cl
2	245	11.4	140	4.4	107
3	379	17.3	137	-	100

Table 2. 2-Day Post Ureteroneocystostomy EnU, Cr

Day	Cr	Ur	Na	K	Cl
2	100	3.6	136	2.3	112

Abbreviations; **EnU,Cr** – Electoryte, Urea and Creatinine. **IVF** – intravenous Fluid

DISCUSSION

Iatrogenic ureteric injuries are well recognised complications of gynaecological surgeries. Total abdominal hysterectomy accounts for the majority of the

causes accounting for about 83%. Corroborating these, our patient had total abdominal hysterectomy.^{3,6,8} Our patient was 48 years; a similar pattern to what had been reported previously indicating that this often occurs in women during their reproductive periods.^{6,15,16,17}

The practice of major gynaecological surgical procedures by inexperienced non-specialist is common in Sub-Saharan Africa.^{5,11} This may lead to increase incidence of ureteric injury and if not properly managed could lead to increase in morbidity and mortality.^{5,11} Our patient was operated by inexperienced non-specialist medical professional. Lack of specialist training and inadequate experience may contribute to this injury. However, an experienced non-specialist can safely perform some gynaecological surgical procedures without increase in the incidence of ureteric injury. Emergency surgeries account for majority of the cases.⁶ Although, our patient had elective surgery, bilateral ureteric injury might have occurred while the surgeon was trying to secure haemostasis. Bilateral ureteric injury is rare and mostly presents later with symptoms ranging from fistula to renal failure.

Our patient presented immediately after the surgery with non-draining urethral catheter, progressive abdominal distension and deterioration of the renal functions. Our patient may have presented later if only one ureter was injured. We infer that bilateral ureteric injury is one of the major factors for early presentation. The main stay of diagnosis is CT urogram. This could not be done in our patient due to financial constraints and deterioration of the clinical condition. We relied majorly on ultrasound findings of significant intraperitoneal collection and bilateral hydroureteronephrosis with progressive deterioration of the renal functions. Treatment depends on the type of injury, presentation, and surgeon choice. Injuries recognised during the initial surgery are generally straightforward to treat involving immediate open repair over a ureteric stent. The management of injuries presenting in the postoperative period generally ranges from endourological retrograde or antegrade stent placemen to open approach and sometimes nephrectomy.^{6,12,14}

Our patient had open approach involving exploratory laparotomy, bilateral ureteroneocystostomy and stenting. Patients with urinary retention or bilateral ureteric obstruction is at risk of hydronephrosis follows by progressive renal damage as evidence by deranged renal functions with progressive elevation of urea and creatinine. Prompts relieve of the obstruction leads to resolution of hydronephrosis and progressive improvement in renal functions. If elevation of urea and creatinine persist despite resolution of the hydronephrosis, this may mean the patient has reached baseline and will not improve further.¹⁵

In our patient, serum creatinine and urea increased rapidly to 379 and 17.3 mmol/l respectively

within 72 hours of injury suggesting rapid deterioration of the renal functions with possible contribution from peritoneal absorption. There was rapid reduction of creatinine and urea to normal with values of 100 and 3.6 mmol/l suggesting complete recovery of the renal functions within 48 hours of repair. As noted in other studies,^{6,12,14} our patient improved significantly with restoration of the renal functions and general clinical improvement.

CONCLUSIONS:

Bilateral ureteric Injury is a urological emergence especially when the patient is rendered anephric by bilateral ureteric ligation. Prompt diagnosis and treatment are important to salvage the renal functions and achieve good outcomes.

Conflict of Interest: The authors declare no conflict of interest.

Ethical Issues: The informed consent of the patient was obtained, and the case report was conducted in compliance with the guidelines of the Helsinki declaration on biomedical research in human subjects. Confidentiality of the patient and personal health information was maintained.

REFERENCES

1. Frank N. Burks, Richard A. Santucci. Management of iatrogenic ureteral injury. *Ther Adv Urol.* 2014 ; 6(3): 115–124.
2. Preston, J. M. Iatrogenic Ureteric Injury: Common Medicolegal Pitfalls, *BJU International.* 2001; 86: 313-317.
3. Brandes, S., Micheal, C., Noel, A. and Jackmaninch: Diagnosis and Management of Ureteric Injury: An Evidence-Based Analysis, *BJU International.* 2001; 94: 277-289.
4. C. Giberti, F. Germinale, M. Lillo, P. Bottino, A. Simonato, and C. Carmignam, “Obstetric and gynaecological ureteric injuries: treatment and results,” *BJU International.* 1996;77:21-26.
5. Williams, G., Broughton, S., Worku, H., and Tekle, H. Five Years’ Experience of Ureterovaginal fistulae Following Obstetric or Gynaecological Intervention in Ethiopia. *Afric. J. Urol.* 2010;16: 17-19.
6. K. H. Tijani, K. I. Onwuzurigbo, R. W. Ojewola, B. B. Afolabi And N. O. Akanmu Iatrogenic ureteric injuries in a Nigerian Teaching Hospital- Experience in the last decade. *East African Medical Journal.* 2011;88: 304 -309
7. Thompson J. D. Operative Injuries to the Ureter; Prevention, Recognition and Management. In: Thompson J. D. , Rock A. J., editors *Telinde’s Operative Gynaecology.* (7th Ed.) Philadelphia: JB Lippincott 1992; 749-83.
8. Aronson, M. P. and Bose, T. M. Urinary Tract Injury In Pelvic Surgery. *Clin. Obst. and Gynae.* 2002; 45: 428-438
9. Paivi, H., Jare, S. and Aila, T. Urinary Tract Injuries after Hysterectomy. *Obst. and Gynae.* 1998; 92.
10. Rosemarie Fröber: *Surgical Atlas, Surgical Anatomy of the Ureter.* 2007 *BJU International.* 100: 949-965.
11. Shittu, O. B., Adeyanju, O. A., Adebayo, A. S., et al. Ureteric Injuries Arising from Obstetric and Gynaecological Operations at University College Hospital Ibadan: A 20 Years Review. *Trop. J. Obst. and Gynae.* 1998; 92.
12. M. Rafique and M. H. Arif, “Management of iatrogenic ureteric injuries associated with gynecological surgery,” *International Urology and Nephrology.* 2002;34:31-35.
13. A. Liapis, P. Bakas, V. Giannopoulos, and G. Creatsas, “Ureteral injuries during gynaecological surgery,” *International Urogynecology Journal.* 2001;12:391-394.
14. R. Menez and D. M. McGinty, “The management of delayed recognized ureteral injuries,” *The Journal of Urology.*1978;119:192-193.
15. Mteta, K. A., Mbwambo, J. and Mvungi, M. Iatrogenic Ureteric and Bladder Injuries in Obstetric and Gynaecological Surgeries. *East Afr. Med. J.* 2006; 83.
16. Nasr, A., El-Tabey, B., Ali-El-Dein, et al. Urological Trauma after Obstetric and Gynaecological Surgeries. *Scandinavian J. Urol. and Nephrol.* 2006; 40: 225-231.
17. Oboro, V., Dare, F. O., Fadiora, S. O., et al. Ureteric Injury Following Pelvic Operations. *East Afr. Med. J.* 2002; 79: 611-613.
18. Kalejaiye O, Speakman M.J. Management of acute and chronic retention in men. *Eur Urol Sup.* 2009 ;8(6): 523-529.