

# Urological injuries following gynecological operations - our experience in a teaching hospital in Nigeria

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## Summary

**Background:** Various grades of urological injuries occur following gynecological operations. Some are recognized during or after surgery but others pass unnoticed.

**Aims and Objectives:** To study the urological injuries that follow gynecological operations in our centre.

**Design:** Retrospective study.

**Setting:** Nnamdi Azikiwe University Teaching Hospital, Nnewi Nigeria, a third generation tertiary institution serving rural, semi-urban, and urban communities.

**Patients and methods:** Searching through the records, all the gynecological operations performed in our centre from 1<sup>st</sup> July 1998 to 30<sup>th</sup> June 2003 were reviewed. Those patients in whom there were documented evidences of urological injuries were noted. Similarly, all the urological injuries treated in our institution during the same period but resulting from gynecological operations carried out in peripheral hospitals were also noted. From the relevant medical records, the following data were extracted: type of gynecological operation, nature of urological injury, time when injury was detected, status of the surgeon, management modalities, and outcome.

**Results:** A total of 37 urological injuries occurred but, because of incomplete records in five, only 32 patients were included in this study. Ligation of the ureters following hysterectomy was the most common injury and occurred in 28 (87.5%) of the patients.

**Conclusions:** Ureteric ligation is a common urological injury following gynecological operations in our centre.

**Key-words:** Urological injuries, Gynecological operations.

## Résumé

Des blessures urologiques de diverses catégories arrivent à la suite des opérations gynécologiques. Quelques-unes sont reconnues pendant ou après la chirurgie mais d'autres passent inaperçues.

**Le but:** Pour étudier des blessures urologiques qui suivent des opérations gynécologiques dans notre centre.

**Le dessein:** Etude rétrospective.

**Le lieu:** Centre Hospitalier – Universitaire de Nnamdi Azikiwe, Nnewi Nigeria, une institution tertiaire de troisième génération qui sert des communautés rurales, semi-urbaines et urbaines.

**Les malades et les procédures:** Recherchant dans des dossiers, toutes les interventions chirurgicales gynécologiques accomplies dans notre centre de 1<sup>er</sup> juillet 1998 au 30<sup>e</sup> juin 2003 sont réexaminées. Des malades qui avaient des preuves documentées des blessures urologiques sont remar-

quées. De même, toutes les blessures urologiques soignées dans notre centre au même temps comme ci – dessus, mais provenant des opérations gynécologiques accomplies aux hôpitaux périphériques sont aussi remarquées. Selon des renseignements médicaux utiles, les données suivantes ont été extraites: le genre de l'opération gynécologique, la nature de la blessure urologique, le moment où la blessure a été dépistée, le statut du chirurgien, les modalités des soins, et le résultat.

**Résultats:** Au total, 37 blessures urologiques se produisirent, mais à cause des rapports incomplètes dans cinq cas, cette étude n'y comprise que 32 malades. Ligature des trompes de fallope à la suite de hystérectomie était la blessure la plus générale qui se produisirent dans 28 (87.5%) ces malades. Les diverses modalités des soins offerts aux malades seront discutées.

**Conclusion:** Ligature des trompes de fallope à la suite de hystérectomie était la blessure la plus générale ces malades.

## Introduction

Urological injuries can occur as a result of either penetrating injury or blunt trauma to the abdomen. Iatrogenic injuries during endoscopic procedures and abdomino-pelvic operations such as in gynecological operations do also occur. In such procedures, a number of factors may be responsible for these injuries, such as inexperience or poor visibility. Poor visibility may result from inadequate retraction, poor lighting, inadequate surgical relaxation of patient, or panic-evoking torrential bleeding. In case of torrential bleeding, there is a high chance of inadvertently clamping and ligating the ureter along with the bleeding vessels.

The incidence of urological injuries following gynecological operations may vary from centre to centre. We hereby share our experience at Nnewi Nigeria, with the international community.

## Patients and methods

By searching through the Operations Register in the main theatre, as well as Patients' Registers both in the relevant wards and in the Accident and Emergency Department, all the gynecological operations performed in our institution from 1<sup>st</sup> July 1998 to 30<sup>th</sup> June 2003 were reviewed. Those patients in whom there were documented evidences of urological injuries were noted. Similarly, all the urological injuries treated in our institution during the same period but resulting from gynecological operations carried out in peripheral hospitals were also noted. The relevant medical records of all these patients whose names and numbers had been noted were then retrieved from the Medical Records Department and, for each patient, the following data were

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extracted: type of gynecological operation, nature of urological injury, time when injury was detected, status of the surgeon, management modalities, and outcome.

**Results**

A total of 37 urological injuries were managed in our centre during the period under review. The medical records of five patients were incomplete. Therefore, only the records of 32 patients were included in this study. Fourteen of the patients had their gynecological operations in peripheral hospitals while the remaining 18 patients had their gynecological operations in our institution. These 18 patients formed part of a total of 1,071 patients who had gynecological operations in our centre during the period, giving an incidence of 1.7%.

ries in three (9.4%) patients, resulting in lacerations in two patients and in vesico-uterine fistula in one patient. Repair of a vesico-vaginal fistula (VVF) led to urethral injury in one (3.1%) patient. Two of the three cases of urinary bladder injuries and two cases of unilateral ureteric ligations were detected intra-operatively during the initial operation (Table 2). The others were detected post-operatively. The single case of vesico-uterine fistula has already been reported.<sup>1</sup> The only case of urethral trauma aroused suspicion because of symptoms of bladder outlet obstruction two months after the operation. Twenty-nine of the gynecological operations, which led to urological injuries, were carried out, in 15 (46.9%) cases, by senior registrars in our centre and, in 14 (43.8%), by general practitioners who worked in peripheral hospitals and who had not acquired any known post-graduate training (Ta-

**Table 1 Gynecological operations associated with urological injuries**

Type of operation	Type of injury	Number of patients	%
Hysterectomy	Ureteric transection with uretero-vaginal anastomosis	1	3.1
	Ureteric ligations: (bilateral)	11	34.4
	(unilateral)	16	50.0
Myomectomy	Urinary bladder lacerations	2	9.4
	Vesico-uterine fistulation	1	3.1
VVF repair	Urethral trauma	1	3.1
<b>Total</b>		<b>32</b>	<b>100.0</b>

VVF = vesico-vaginal fistula

**Table 2 Time when injury was detected**

	Type of injury	Number of patients	%
Intra-operatively:	Urinary bladder lacerations	2	6.3
	Ureteric ligations (unilateral)	2	6.3
Post-operatively: Suspected	Ureteric ligations (bilateral)	11	34.4
	Urethral trauma	1	3.1
	Vesico-uterine fistulation	1	3.1
Not suspected	Ureteric ligations (unilateral)	13	40.6
	Ureteric transection with uretero-vaginal fistula	1	3.1
	Ureteric transection with urinoma	1	3.1
<b>Total</b>		<b>32</b>	<b>100.0</b>

Abdominal hysterectomy was the most common operation associated with urological injuries, and led to injuries of the ureters in 28 (87.5%) patients (Table 1). These ureteric injuries consisted of unilateral ureteric transection with uretero-vaginal anastomosis in one patient, bilateral ureteric ligations in 11 patients and unilateral ureteric ligations in 16 others. Myomectomy gave rise to urinary bladder inju-

ries in three (9.4%) patients, resulting in lacerations in two patients and in vesico-uterine fistula in one patient. Repair of a vesico-vaginal fistula presented as continuous leakage of urine per vaginam and was initially thought to have vesico-vaginal fistula. The patient with vesico-uterine fistula presented with cyclical haematuria. The treatment modality

**Table 3 Status of surgeon causing urological injury**

Surgeon	Type of injury	Number of patients	%
Senior registrar:	Ureteric ligations	13	40.6
	Vesical lacerations	2	6.3
General practitioners Working in			
Peripheral hospitals:	Ureteric ligations	12	37.5
	Vesical injury	1	3.1
	Uretero-vaginal anastomosis	1	3.1
Consultant gynecologists:			
	Ureteric ligations	2	6.3
	Urethral trauma	1	3.1
<b>Total</b>		<b>32</b>	<b>100.0</b>

**Table 4 Treatment given, and outcome**

Treatment	Number of patients (%)	Outcome
Ureteroneocystostomy	26 (81.3%)	Good
Urinary bladder-repair	2 (6.3%)	Good
Disconnection of vesico-uterine fistula	1 (3.1%)	Good
Tube ureterostomy	3 (9.3%)	Died
<b>Total</b>	<b>32 (100.0%)</b>	

for the uretero-vaginal fistula was uretero-neocystostomy whereas in the case of vesico-uterine fistula, simple excision of the fistula was done, with repair of the bladder and the uterus. Urinary bladder lacerations were repaired in two layers. The patient with unilateral transection of the ureter presented with a urinoma and was treated by drainage and re-implantation of the ureter (ureteroneocystostomy). The two cases of ureteric ligations, which were detected intra-operatively, were treated by immediate removal of the ligatures, careful arrest of the bleeding vessels, which led to the ureteric ligations and insertion of a retroperitoneal drain. Three of the 16 patients with unilateral ligation of the ureter were found to have non-functioning kidneys on the ipsi-lateral side and were therefore offered nephrectomy. The rest of the patients in this group presented with hydronephrosis with or without various degrees of hydronephrosis and were successfully treated by re-implantation of the ureters. All the 11 cases of bilateral ureteric ligations were treated, initially by unilateral tube ureterostomy. Three of these patients died within the first week of this procedure. The remaining eight patients later had bilateral re-implantation of the ureters. The three dead patients had their gynecological operations in peripheral hospitals from where they were referred to our institution with the diagnosis of renal failure.

### Discussion

In this study, the incidence of urological injuries was 1.7%. Liapis et al<sup>2</sup> in 2001 recorded a 0.35% incidence of ureteric injuries in their work, but they focused only on ureteric

injuries. In 2001, Liapis et al<sup>2</sup> as well as Karmouni et al<sup>3</sup> reported that ureteric injuries were more common than injuries of other parts of the urinary tract in major pelvic operations. In this present work, ureteric injuries were the most common injuries associated with gynecological operations, specifically hysterectomies. This agrees with work done by Shittu et al<sup>4</sup> in Ibadan, Nigeria. We were able to detect only four such injuries (12.5%) in theatre during the primary surgery whereas Liapis et al<sup>2</sup> detected 50.0% of their ureteric injuries intra-operatively during the primary operation. Those cases which were detected early had early repair and good outcome but those cases which were diagnosed late had poor outcome. This was re-echoed by Oh et al<sup>5</sup> in 2000, Karmouni et al<sup>3</sup> in 2001, and by Essiet et al<sup>6</sup> in 2004. In our study, which agrees with work done by Oboro et al<sup>7</sup>, most of these injuries to the ureters were discovered after the primary operation. Only a few were detected during the primary surgery.

Also in our study, majority of these gynecological operations, which led to urological injuries, were by general practitioners who had not acquired any known post-graduate training, and by surgeons-in-training. Consultant gynecologists were involved in only three cases. This low rate of injuries in the hands of the consultants may be related to expertise since the consultant surgeon is expected to be more skilled and experienced than either the general practitioner or the surgeon-in-training.

In treating our ureteric injuries, our mode of re-implantation was ureteroneocystostomy (Table IV). All the cases of ureteric injuries in our series were in the distal ureter and

were therefore amenable to re-implantation procedures. In those cases of bilateral ureteric ligation, a preliminary one-sided tube ureterostomy was carried out. This procedure, which was reasonably minimal in these ill patients brought down the deranged serum urea, electrolytes and creatinine to normal levels which then made the patients fit for re-implantation operation. Other treatment modalities for ureteric injuries include end-to-end anastomoses or substitution ureteroplasty, depending upon the extent of tissue loss, as reported by Chitale and Webb<sup>8</sup> in 2001. Discovering a late and extensive upper ureteric injury in their practice, Rios-Gonzalez et al<sup>9</sup> in 2002 offered their patient renal auto-transplantation. Fabrizio et al<sup>10</sup> report other modalities of treatment of these complex proximal ureteric injuries to include ileal ureteric interposition or extensive spiral bladder flaps but favour laparoscopic nephrectomy and subsequent autotransplantation. We had three deaths due to late presentation of bilateral ureteral ligations. Although Oh et al<sup>5</sup> had good outcome in all the 12 cases of ureteric injuries they treated, Karmouni et al<sup>3</sup> recorded one death out of the 30 patients they treated for ureteric injuries.

In conclusion, early treatment of urological injury gives a good outcome in our series. Finally, in trying to arrest bleeders during pelvic operations, the surgeon should resist the temptation of clamping bleeding vessels blindly.

#### References

1. Okafor P I S, Orakwe J C, Mbonu O O. Cyclical hematuria sequel to uterine myomectomy: a case report. *WAJM*. 2002; 21: 341 - 2.
2. Liapis A, Bakas P, Giannopoulos V, Creatsas G. Ureteral injuries during gynecological surgery. *Int-Urogynecol-J-Pelvic-Floor-Dysfunct*. 2001; 12: 391-3; discussion 394.
3. Karmouni T, Patard J J, Bensalah K, Manunta A, Guille F, Lobel B. Urologic Management of ureteral iatrogenic lesions. *Prog-Urol*. 2001; 11: 642 - 6.
4. Shittu O B, Adeyanju O A, Adebayo A S, Okunlola A, Olayemi O O, Obisesan K A. Ureteric Injuries Arising from Obstetric and Gynecological Operations at the University College Hospital Ibadan: a 20-year Review. *Trop J Obstet Gynaecol*. 2003; 20: 32 - 36.
5. Oh B R, Kwon D D, Park K S, Ryu S B, Park Y I, Presti J C Jr. Late presentation of ureteral injury after laparoscopic surgery. *Obstet-Gynecol*. 2000; 95: 337 - 9.
6. Essiet A, Irekpita E E, Etuk S J, Ekanem A D. Ureteric injuries complicating obstetric and gynaecologic operations in the University of Calabar Teaching Hospital. *Global Journal of Medical Sciences* 2004; 3(1 & 2): 1-3.
7. Oboro V O, Dare F O, Fadiora S O, Aderounmu A O A, Adeoti M L, Ajadi A M. Ureteric injuries following pelvic operations. *East African Medical Journal* 2002; 79: 611-613.
8. Chitale S V, Webb R J. Ureteric stenting for repair of accidental ureteric injuries. *Ann-R-Coll-Surg-Engl*. 2001; 83: 244 - 5.
9. Rios-Gonzalez E, Ramon-de-Fata-Chillon F, Tabernero-Gomez A, Nunez-Mora C, Hidalgo-Togores L, de-la-Pena-Barthel J J. Iatrogenic injury of the lumbar ureter and iliac vessels after lumbar discectomy: urologic treatment using kidney auto-transplantation. *Actas-Urol-Esp*. 2002; 26: 504 - 8.
10. Fabrizio M D, Kavoussi L R, Jackman S, Chan D Y, Tseng E, Ratner L E. Laparoscopic nephrectomy for auto-transplantation. *Urology*. 2000; 55: 145.