



Iatrogenic Ureteral Injuries Associated with Gynecological and Surgical Procedures: Our Experience About 18 Cases and Literature Review

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Aim: To describe the epidemiological aspects, etiology and outcome of iatrogenic ureteral injury repair at the urology division of Souro Teaching Hospital of Bobo Dioulasso (Burkina-Faso).

Patients and Methods: This was a retrospective descriptive study of consecutive patients with iatrogenic ureteric injuries who were referred and managed in the urology division of Souro Sanou Teaching Hospital (Bobo-Dioulasso) from January 2012 to December 2017. Variables studied were age, the time at the diagnosis, the causative event, the method of repair, and the outcome of the management.

Results: The mean age was 37.72±3.5 years coming from the rural population in most cases. The mean time at the diagnosis was 15 days. The injuries were due to gynecologic surgeries with hysterectomy (66%) and caesarian section (33%). Ureteric reimplantation with anti-reflux system was performed in seventeen patients. The rate of treatment success was 94% and the postoperative course was uneventful for all the patients.

Conclusion: Iatrogenic ureteric lesions at the department of urology of Sanou Sourou teaching hospital of Bobo Dioulasso were mainly caused by gynecologic and obstetric surgeries like hysterectomy and caesarian section.

Keywords: iatrogenic, ureter, injury, pelvic surgery

Introduction

Pelvic surgery is relatively difficult due to the richness and the particularity of this anatomic region in terms of neurovascular and visceral organs.¹ Iatrogenic ureteral injury is a potential complication of all surgical procedures performed in the pelvis.² It occurs mainly during female pelvic surgery and can result in devastating consequences and even mortality in the short-term and potential loss of organ function in the long-term.³ These lesions are generally managed by urologists and sometimes in association with gynecologists.⁴ The close anatomical relationships between the urinary and genital tracts in women was the main risk factor of iatrogenic injuries during surgical procedures. In addition, poor knowledge of anatomy of the pelvic area by surgeon and his qualification, anatomical variations, surgical bleeding, obesity, malignant tumor surgeries and presence of adhesions in pelvic are also risk factors that can lead to inadvertent damage of the ureter.⁵ Frequency, clinical and therapeutical characteristics of

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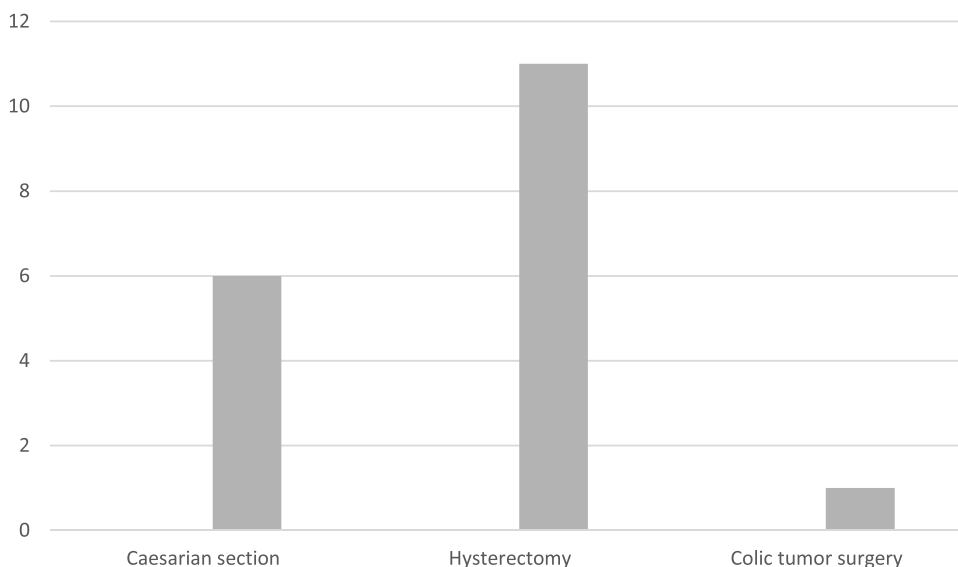


Figure 1 Distribution of patients according to the causative event.

iatrogenic ureteral injuries are not well described in our setting and no previous reports are available on the occurrence of such complications in our context. The aim of this study was to describe the epidemiological, anatomic and therapeutical aspects of iatrogenic ureteral injuries during pelvic surgery in Souro Sanou University Teaching Hospital.

Patients and Methods

This was a retrospective descriptive study concerning all the patients with iatrogenic ureteric injuries managed in the context of emergency or scheduled surgery in the urology division of Souro Sanou Teaching Hospital of Bobo Dioulasso from January 2012 to December 2017. We included the cases of ureteral injuries in which information about clinical observation, imaging (abdomino-pelvic ultrasound, intravenous urography, or CT scan) and operative report were available. Variables studied were age, the timing of diagnosis, the causative event, the method of repair of the lesions and the outcome of repair. The data were analyzed using Epi Info software

Table 1 Distribution of Patients According to the Side of the Lesion

Ureteral Injury	Frequency	Percentage (%)
Left side	13	72.22
Right side	4	22.22
Bilateral	1	5.56
Total	18	100

version 7. The qualitative variables were expressed in terms of proportion while quantitative variables consisted of measuring the mean with SD, median and ranges. Ethics approval was granted by the Ethics Committee of the Department of Surgery, University Teaching Hospital Souro Sanou. Previously admitted to the hospital, all the patient were informed and consented to review their medical records, and their names and identities were protected and anonymous.

Results

During the study period of six years, 18 patients were managed for iatrogenic ureteric injuries in the division of urology of Souro Sanou Teaching Hospital of Bobo Dioulasso, giving a frequency of three cases per year.

The mean age of the patients was 37.72±3.5 years. Most of the patients were housewives (88.88%), out-of-school (83.33%) and were from rural areas (66.7%).

According to the mode of admission, only one third (1/3) of the patients were admitted in the operating room in a context of emergency, in contrast to two thirds of them who were referred from a primary or rural medical center for better management. The mean time between the patient referral and the surgery was 15 days ranging from 24 h to six months (180 days).

The modes of the presentation were leakage of urine in peritoneum (1), anuria or oliguria after surgery (3), flank or lumbar pain (4), urinary leakage from vagina (3), and six patients did not have complaints. The ureter injuries were diagnosed after intravenous urography (IVU).



Figure 2 Reconstruction CT scan: posthysterectomy left ureterohydronephrosis with pelvic ureter injury (red arrow).

Among the causative events, hysterectomy was the first procedure which provides iatrogenic ureteral injury (Figure 1). All the hysterectomy procedures were performed by abdominal route. In one patient the lesion was recognized operatively during the surgery. It was a section of the pelvic portion of right ureter and ureterostomy was performed timely before her reference to the urology division of Sourou Sanou Teaching Hospital for appropriate surgical management by an urologist.

The type of ureteral injury was respectively, suture in 50% of patients, partial ligation in 25% of patients and complete ureteric transection in 25%.

According to the laterality, the left pelvic ureter was most injured compared to the right one (Table 1).

Intravenous urography (IVU) or CT scan were performed in six patients and all of them had pelvicalyceal dilatation or ureterohydronephrosis at diagnosis (Figure 2).

About the management, 17 patients had benefited from ureteric reimplantation with antireflux system. One patient was managed by JJ stent placement. The cure of ureterovaginal fistula was performed in a second patient.

The follow-up was uneventful and 17 patients were totally cured without any postoperative complications.

Discussion

During the study period of six years, 18 cases of iatrogenic ureteral injury were recorded, giving a frequency of three cases per year. Frequency of 3.5 cases per year was reported by El Abd in Egypt during 28 years.^{5,6} Although iatrogenic ureteric injury is relatively uncommon, it is a serious event occurring during surgery with a real medicolegal implication.^{7,8}

The mean age was 37.72 years. Kirakoya et al in Ouagadougou, Bouya et al in Brazzaville and Kpatcha et al in Dakar reported a mean age of 36.4 years, 37 years and 34.2 years in their respective series.^{9–11} In fact, it is during the premenopausal period, during their thirties that most women underwent hysterectomy for benign diseases like fibroma or uterine prolapse; thus increasing their risk of ureteric injury.¹² The mean timing of diagnosis was 15 days ranging from 1 to 180 days. An early diagnosis of ureteral injury is difficult despite an intraoperative assessment of hematuria or cystoscopy.¹³ However, hematuria is typically absent on initial presentation. Symptoms of a late diagnosis are usually nonspecific and include prolonged ileus, urinary leakage, prolonged high output from drains, fever/sepsis, persistent flank or abdominal pain, urinary obstruction, elevated creatinine or blood urea nitrogen, and flank mass.¹⁴ As delayed diagnosis and consequently delayed management results in higher complications including infection, urinoma, ureteric stricture, urinary fistula, and renal loss, surgeons had to be aware of this lesion for early recognition.

In our study, gynecologic surgery was the causative event of the ureter postoperative injuries (95%). A past review has confirmed the superiority of gynecologic surgery as a cause of iatrogenic ureteral injury.¹⁵ In contrast to that reported by Olatunji et al in Nigeria where caesarian delivery was the leading gynecologic surgery, in our study, hysterectomy was reported in 61%. Globally, iatrogenic ureteric trauma is the common cause of ureteral injury with gynecologic surgery being the most causative event.¹⁶

According to the laterality, the lesion was unilateral in 95% with the left ureter 72% of cases. In the study of Chalya et al in Tanzania, the left side was also reported in 70% of cases.¹⁷ The left ureter is much more at risk, and most prior series reveal iatrogenic ureteral injury on the left three to five times more often than on the right side. This increased risk

to the left ureter is related to its course, which places it much closer to the cervix than the right ureter.¹⁸

Bilateral ureteral injury was reported in one case. The 30-year-old patient underwent vaginal hysterectomy for pelvic organ prolapse and secondary referral to our emergency unit for postoperative anuria. Diallo et al did not report any case of bilateral ureteral injury.¹⁹ It is evident that a bilateral lesion shared a double risk for the patient, including genito-urinary fistulae and may influence the outcome of the management.^{20–22}

According to the therapeutic aspects, all of our patients underwent open surgery with uretero-vesical reimplantation except one of who was managed by JJ stent placement with a total success rate of 94%. No complication was observed in our series. Goodwin and Scardino had a success rate of 100% for the 16 patients in their series treated with ureteroneocystostomy.²³ Beland found that reimplantation of the ureter with an anti-refluxing technique is preferable.²⁴ Ureterovesical reimplantation is a complex but well known and codified intervention with good functional results and lower morbidity when done by an experienced surgeon.

Conclusion

Iatrogenic ureteral injuries in our urology division were mainly due to gynecologic-obstetric surgery, especially hysterectomy and caesarean delivery. They are related to the pathological context often resulting in anatomical changes on the one hand and the lack of experience of some surgeons on the other hand. A close collaboration and partnership between urologists and gynecologists, therefore, appears to be essential in our setting in order to optimize the management of these adverse events, which are not devoid of subsequent consequences.

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Disclosure

The authors report no conflicts of interest in this work.

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