

## SURGICAL REPAIR OF IATROGENIC URETERAL INJURY SECONDARY TO GYNECOLOGIC SURGERY

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### Abstract

*Operative injuries to the urinary tract are common during the course of gynecological surgery due to close development and proximity of the urogenital organ systems. Its incidence is low but ureteric injury may have serious implications in terms of morbidity. The retrospective and descriptive study was carried out in the urological department of Clinical Hospital "Prof.Dr.Theodor Burhele", Bucharest. 24 cases with iatrogenic ureteral injury were included, between January 2010-January 2015. The following parameters were studied: age, cause of primary surgery, association of radiotherapy, type of injury, treatment, complications and results and follow-up. Hysterectomy, associated or not with radiotherapy, was detected as primary risk in ureteral iatrogenic injury. The age range was between 29 to 76 years old, with a mean of 51 years. In 15 of 24 cases the patient undergone radical hysterectomy for cervical cancer, 8 cases undergone hysterectomy for uterus fibroma and in 1 case the cause of intervention was a C-section. 13 patients needed also radiotherapy while 11 of them were not subjects to radiotherapy. In 18 cases urethra hidronephrosys (II-IV) was present due to a pelvic ureteral stenosis. In 4 cases the patients presented uretero-vaginal fistula and 2 patients presented uroperitoneum with uretero-peritoneal fistula. 14 cases were submitted to repair surgery while 9 cases were subject to JJ stent only and in 1 case permanent nephrostomy was needed. 8 of 14 cases which were subjects to repair surgery had not encountered perioperative or late complications. In 2 cases secondary nephrectomy was needed due to repeated pielonephritis. In other 2 cases a secondary ureteroneocystostomy was needed, In 1 case recurrent neoplasm was recorded and patient needed permanent bilateral nephrostomy and in 1 case persistent ureterohidronephrosis was noted and the patient was subject to permanent nephrostomy and JJ stent. Iatrogenic ureteral lesions are common in gynecologic surgery and have a great impact on morbidity. Gynecologists should be aware of urologic injury during surgery and should always take preventive measures.*

**Keywords:** *iatrogenic ureteral injury, urologic surgery, uretero-peritoneal fistula*

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### Introduction

Injury to the urinary tract involves injury to the ureters, bladder and urethra. Although with a low incidence, ureteral injuries appear commonly during various pelvic and gynecologic

procedures due to close development and proximity of the urogenital organ systems. According to the literature, more than 50% of all iatrogenic injuries occur during gynecologic surgery [1-4]. Ureteral injury is one of the most problematic complications with significant

postoperative morbidity in pelvic and abdominal surgical procedures. Unrecognized ureteral injury can cause prolonged postoperative morbidity leading to fistula formation, sepsis, or renal functional loss [5,6]. The treatment of choice for lower ureteral injuries, not amenable to conservative or endoscopic management, is ureteroneocystostomy. We present our experience in managing the patients with gynecologic traumatic injury of the distal ureter with regard to its feasibility, safety, and short-term results.

**Materials and methods**

In a retrospective analysis, data were reviewed from 24 patients who were treated for iatrogenic ureteral lesions in our Urological Department at Clinical Hospital “Prof. Dr. Th. Burghela”, Bucharest. The study was carried out between January 2010-January 2015. All patients were given information on the surgical procedure prior to surgery, and informed consent was obtained from each patient. The following parameters were studied: age, cause of primary surgery, association of radiotherapy, type of injury, treatment, complications and results and follow-up (Figure 1).

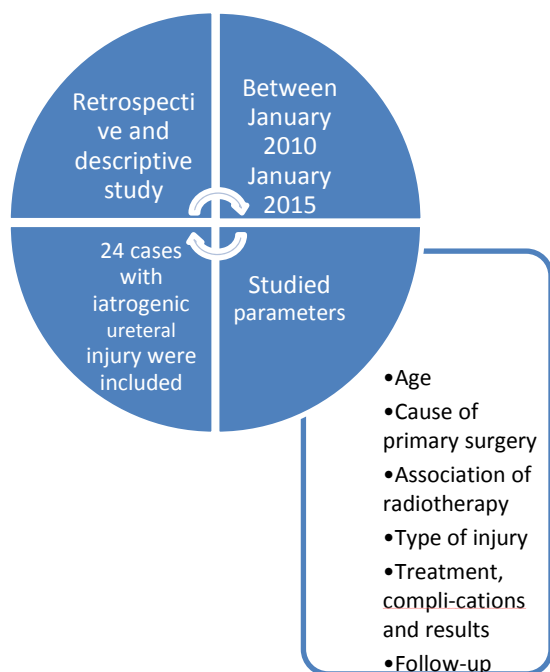


Figure 1 - Study parameters

The damaged suspicious lesion was confirmed by direct inspection or cystoscopy evaluation of urinary efflux. All patients suited for repair surgery went to operating room for a uretero-neocystostomy. During ureteroneocystostomy, the ureter underwent anastomosis to the lateral wall of the bladder using interrupted size 4-0 vicryl sutures extravesical non-refluxing technique. The bladder was drained by a Foley catheter for 14 days. The signs and symptoms in patients with postoperatively recognized ureteral injury included urinary leakage, flank pain, azotemia, anuria, and fever.

Ureteral intactness was evaluated by intravenous pyelography (IVP), retrograde pyelography (RGP), and contrast computerized tomography (CT), in selected cases. After repair of the ureteral injury was complete, success was defined on the basis of IVP or contrast CT.

**Results**

Among the 24 cases of iatrogenic ureteral lesions identified during the study period, all of the incidents occurred after gynecologic surgery and 14 of them underwent early surgical repair. The mean age of the patients was 51 years (range, 29–76 years) and none had undergone a previous attempt at repair. Hysterectomy, associated or not with radiotherapy, was detected as primary risk in ureteral iatrogenic injury.

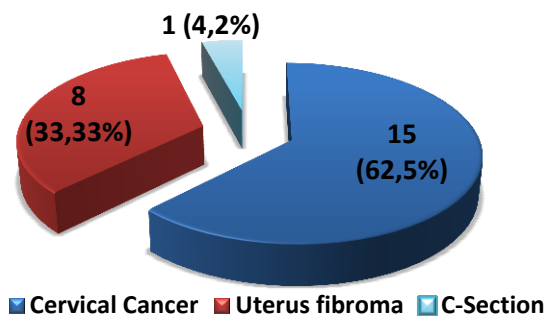
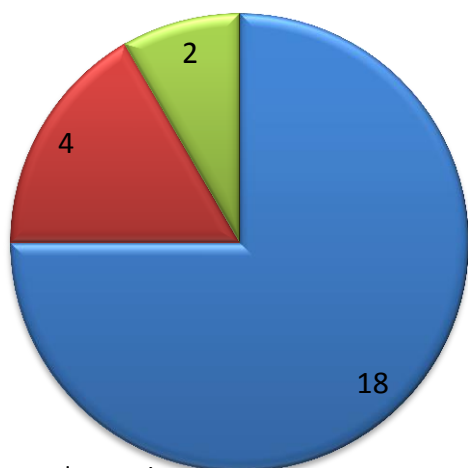


Figure 2 – Distribution of the cases

In 15 of 24 cases ( 62,5%) the patient undergone radical hysterectomy for cervical cancer, 8 cases (33,3%) undergone hysterectomy for uterus fibroma and in 1 case (4,2%) the cause of intervention was a C-section (Figure 2).

13 patients (54,1%) needed also radiotherapy while 11 of them (45,9%) were not subjects to radiotherapy.

All iatrogenic diagnoses were confirmed by cystoscopy and intravenous or retrograde pyelography. In 18 cases (75%) ureteral hidronephrosys (II-IV) was present due to a pelvic ureteral stenosis. In 4 cases (16,6%) the patients presented uretero-vaginal fistula and 2 (8,4%) patients presented uroperitoneum with uretero-peritoneal fistula (Figure 3).



- Pelvic ureteral stenosis
- Uretero-vaginal fistula
- Uretero-peritoneal fistula

Figure 3 – Distributions of the cases

All patients received intraoperative antibiotic prophylaxis with third-generation cephalosporins, and treatment was continued postoperatively for 120 hours.

14 (58,3%) cases were submitted to repair surgery. The standard repair in such cases was ureteroneocystostomy. No major intraoperative complications occurred.

9 (37,5%) cases were subject to JJ stent only and in 1 case (2,1%) permanent nephrostoma was needed. (Figure 4)

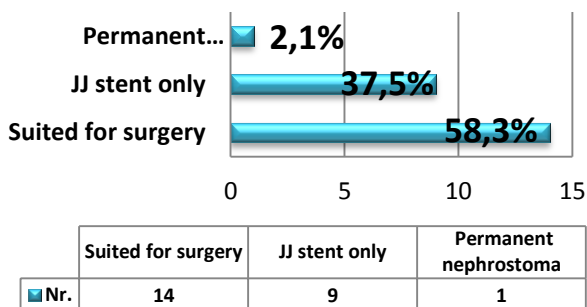


Figure 4 - Type of the intervention

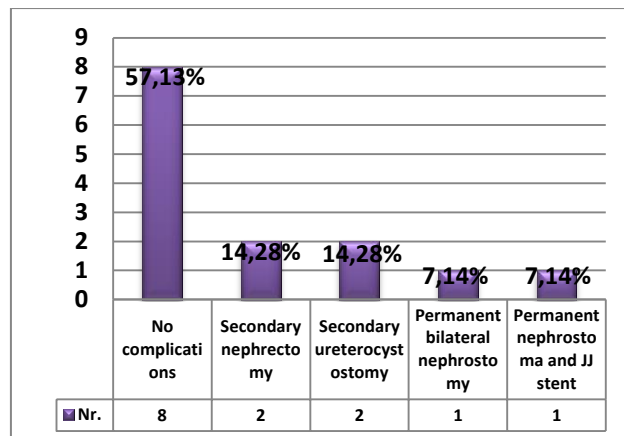


Figure 5 - Complications

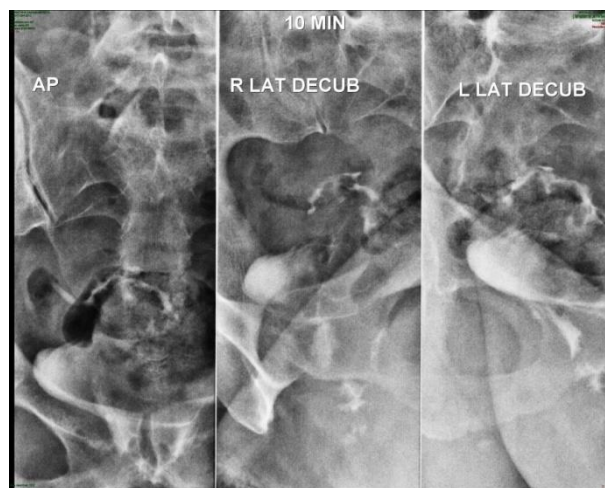


Figure 6 - Uretero-vaginal fistula



Figure 7 - Intravenous pyelography after surgery



Figure 8- Pelvic ureteral stenosis



Figure 9- Intravenous pyelography after surgery

8 of 14 cases (57,13%) which were subjects to repair surgery had not encountered perioperative or late complications. In 2 cases ( 14,28%) secondary nephrectomy was needed due to repeated pyelonephritis . In other 2 cases (14,28%) a secondary ureteroneocystostomy was needed, In 1 case (7,14%) recurrent neoplasm was recorded and patient needed permanent bilateral nephrostomy and in 1 case (7,14%) persistent ureterohydronephrosis was noted and the patient was subject to permanent nephrostomy and JJ stent (Figure 5).

Follow-up intravenous pyelography was performed 6 months after surgery (Figures 6-9).

## Discussions

Injury to the ureter is a risk of any pelvic or abdominal surgery, including laparoscopy [9-15]. It has a high morbidity, resulting secondary invasive interventions, reoperation, increased hospital stay, potential loss of renal function or compromise of the original surgical outcome. With the most common major as hysterectomy, gynecologic procedures have traditionally accounted for the majority of iatrogenic ureteral injuries [16-30].

## Conclusions

Urological injuries in gynecological surgeries occur commonly which have serious implications in terms of morbidity. Surgeons should take preventive measures to avoid ureteral injury during gynecologic surgery, especially in patients with risk factors. If it is necessary prophylactic ureteral stenting should be considered preoperative

If a woman is not making satisfactory postoperative recovery, the possibility of ureteric injury should be considered. Radiographic investigations and laboratory investigations should be performed sooner rather than later if there is the slightest suspicion of ureteric injury All in all gynecologist has to be conscious of the possibility of urological injuries and take preventive measures

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