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# Conservative Treatment with Double Pig Tail Placement in a Patient with an Iatrogenic Lesion of the Distal Ureter

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## ABSTRACT

*Iatrogenic ureteral injury (IUI) is a potentially devastating complication of open and laparoscopic surgery of the abdominal cavity, with open hysterectomy being the procedure that most frequently leads to these injuries [1]. Treatment options for IUI include percutaneous nephrostomy in patients unsuitable for immediate surgical exploration, PIG-TAIL placement for traction injuries without ischemia, and open surgical repair of the injured ureter [2]. We present the case of a 46-year-old female patient who, after a laparoscopic hysterectomy, presented a grade 2 injury in the distal third of the right ureter, which caused chemical peritonitis due to uroperitoneum, repaired with 2 PIG - TAIL COOK FIRM, under cystoscopic and fluoroscopic guidance, leaving Jackson-Pratt drain in the abdominal cavity and a patent Foley catheter, with subsequent reoperation to remove the ureteral stent, observing good healing of the distal ureter and preserved renal function.*

## Keywords

Iatrogenic ureteral injury, Laparoscopic hysterectomy.

## Introduction

Most ureteral injuries are due to iatrogenic causes, secondary to laparoscopic or open surgical procedures, with hysterectomy (54%) being the procedure with the highest risk of ureteral injury, followed by colorectal surgery (14%) and removal of a tumor ovarian (8%) [3].

The incidence occurs in 1.3 per 1000 gynecological surgeries [4]. The risk of ureteral injury increases in patients with pelvic adhesions or abnormal anatomy, which leads to the fact that in most cases the diagnosis occurs postoperatively [2].

The manifestations of a IUI are usually non-specific. In some cases, the patient may present with persistent abdominal pain, a palpable mass on the flanks, paralytic ileus, hydronephrosis, and renal failure [3].

According to the European Association of Urology and the American Association of Urology, the most used and useful test for the diagnosis of IUI is contrast-enhanced urotomography in the excretory phase since it allows us to see contrast extravasation in the injured ureter. urinomas, ascites, fistulas, dilation of ureters, etc [5].

Treatment depends on the time of diagnosis, as well as the extent of the lesion, and ranges from endoscopic management to complex surgical reconstruction using pedicled grafts, depending on the degree of ureteral lesion [4]. PIGTAIL insertion is a widely used procedure to prevent or relieve ureteral obstruction and maintain a patent ureter in patients with renal lithiasis and tumors involving the urothelium, it also prevents urine leakage and can serve as a scaffold for ureteral healing injured [6,7].

## Case Report

We report the case of a 46-year-old female patient, with a history of laparoscopic hysterectomy performed 9 days prior to admission, who came to our center with dysuria, unquantified fever, and pain

of progressive onset, located in the hypogastrium, of moderate intensity. Stinging, not irradiated, which increased when standing up and when performing Valsalva maneuvers. On admission, the patient presented mild mucosal skin pallor, decreased capillary refill, tachycardia, tachypnea, flat, soft, slightly depressed abdomen, painful on deep palpation, Blumberg negative for the moment. Laboratory tests performed on admission revealed: leukocytosis with a left shift, normocytic, normochromic anemia, reactive thrombocytosis, and elevated acute phase reactants (Tables 1 and 2), simple non-pathological urine test (Table 3). An abdominal ultrasound was performed where grade II right hydronephrosis and dilatation of the renal pelvis and proximal ureter of up to 16 mm (Image 1) were observed, abundant free fluid in the abdominal cavity of approximately 1000cc from perihepatic, perivesicular, perisplenic and pelvic locations (Image 2). In view of these findings, it was decided to perform contrast-enhanced urotomography where it was observed: grade II hydronephrosis of the right kidney, pelvic and right ureteral calyceal dilation, the right ureter was appreciated in its entirety, however it had a lack of continuity in its distal third, appreciating contrast substance in the abdominal cavity (Image 3), left kidney without alterations.

**Table 1:** Laboratory on admission – Complete blood count.

| | |
|---|---|
| RBC | 3410000 cel/mm$^3$ (4100000 - 5100000) |
| WBC | **13300 cel/mm$^3$** (4400 - 11300) |
| Eosinophils | 0% |
| Basophils | 0% |
| Neutrophils | **83%** |
| Lymphocytes | 10% |
| Monocytes | 7% |
| Hemoglobin | **10.1 g/dL** (12.3 - 15.3) |
| Hematocrit | **29.0 %** (35 - 47) |
| MCV | 85.0 fl (80 - 96) |
| MCH | 29.6 pg (28 - 33) |
| MCHC | 34.8 % (33 - 36) |
| Platelet count | **670000 cel/mm$^3$** (149000 - 409000) |

**Table 2:** Laboratory on admission – Biochemistry.

| | |
|---|---|
| Glucose | 98 mg/dL (70 - 100) |
| Urea | 27 mg/dL (11 - 50) |
| Creatinine | 0.89 mg/dL (0.5 - 1.2) |
| C Reactive Protein | **29.43 mg/dL** (0 - 0.5) |
| Electrolytes: | |
| Sodium | **132 mEq/L** (135-145) |
| Potassium | 3.67 mEq/L (3.5-5.5) |
| Chlorine | **95.2 mEq/L** (97-111) |
| Coagulation Profile: | |
| TTP | 32.2 seg (0 - 39) |
| TP | **16.5 seg** (12 - 15) |
| INR | **1.34** (0.8 - 1.2) |

Based on the clinical, paraclinical and imaging findings, we diagnosed a postoperative lesion of the distal ureter, to rule out chemical peritonitis due to uroperitoneum. Antibiotic therapy was started with vancomycin at a dose of 1 g intravenously (IV) every 12 hours and meropenem at a dose of 1 g iv every 8 hours. It was decided to perform a bilateral ureteroscopy and exploratory laparoscopy, where was found: section of the distal right ureter 4 cm from the ureteral meatus with peripheral inflammation, left ureter without alterations and abundant yellowish fluid in the abdominal cavity (900cc). In view of grade 2 ureteral injury, conservative management was decided with the placement of 2 PIGTAIL COOK FIRM 4.7 x 24 cm under cystoscopic and fluoroscopic guidance in the right ureter (Image 4), leaving Jackson-Pratt drainage (drain) in the abdominal cavity and Foley catheter permeable.

**Table 3:** Laboratory on admission.

| | |
|---|---|
| Simple Urine Test | Yellow, transparent appearance, epithelial cells 1-3/xC, leukocytes in urine 2-3/xC, red blood cells in urine 0-2/xC. Scarce germs. No crystals, casts, or nitrites are seen in urine. |
| Urine Culture | Rare gram-positive cocci (vaginal flora). Negative culture at 72 hours. Antimicrobial activity is detected in urine. |

She was hospitalized in our service for 14 days receiving antibiotic therapy; under observation, we noticed peritoneal fluid leakage through the drain, with its progressive decrease. Peritoneal fluid study revealed the presence of creatinine, demonstrating the diagnosis of uroperitoneum (Table 4).

**Table 4:** Postoperative laboratory – Peritoneal fluid.

| | |
|---|---|
| Color | Haematic |
| Aspect | Slighty coudy |
| RBC in liquid | 45000/mm$^3$ |
| Glucose in liquid | 86.0 mg/dL (48 - 200) |
| Proteins in liquid | **2.13 mg/dL** (20 - 55) |
| pH | 8 (7.8 - 8.2) |
| LDH | 361 U/L (10% of the serum level) |
| Germs | Negative |
| Creatinine | **Positive: 1.7 g/dL** |

Subsequent evolution was favorable, with clinical and laboratory improvement (Table 5 and 6), she was discharged with removal of the drain and successive check-ups by an outpatient clinic. 6 months later, the ureteral endoprosthesis (PIGTAIL) was removed. Control urotomography reported normal ureters, with good passage of contrast, without narrowing, kidneys with normal anatomical characteristics (Image 5) and preserved renal function.

**Table 5:** Postoperative laboratory – Hemogram.

| | |
|---|---|
| RBC | 3810000 cel/mm$^3$ (4100000 - 5100000) |
| WBC | 9540 cel/mm3 (4400 - 11300) |
| Eosinophils | 5% |
| Basophils | 0% |
| Neutrophils | 62% |
| Lymphocytes | 24% |
| Monocytes | 9% |
| Hemoglobin | **11.2 g/dL** (12.3 - 15.3) |
| Hematocrit | **32.5 %** (35 - 47) |
| MCV | 85.3 fl (80 - 96) |
| MCH | 29.4 pg (28 - 33) |
| MCHC | 34.5 % (33 - 36) |
| Platelet count | **970000 cel/mm$^3$** (149000 - 409000) |

**Table 6:** Postoperative - Biochemistry.

| | |
|---|---|
| Glucose | 99 mg/dL (70 - 100) |
| Urea | 17 mg/dL (11 - 50) |
| Creatinine | 0.5 mg/dL (0.5 - 1.2) |
| C Reactive Protein | **3.25 mg/dL** (0 - 0.5) |
| Electrolytes: | |
| Sodium | 137 mEq/L (135-145) |
| Potassium | 4.06 mEq/L (3.5-5.5) |
| Chlorine | 99 mEq/L (97-111) |


**Image 1:** Abdominal ultrasound: grade II right hydronephrosis. Renal pelvis dilation.


**Image 2:** Abdominal ultrasound: abundant free fluid in the abdominopelvic cavity.

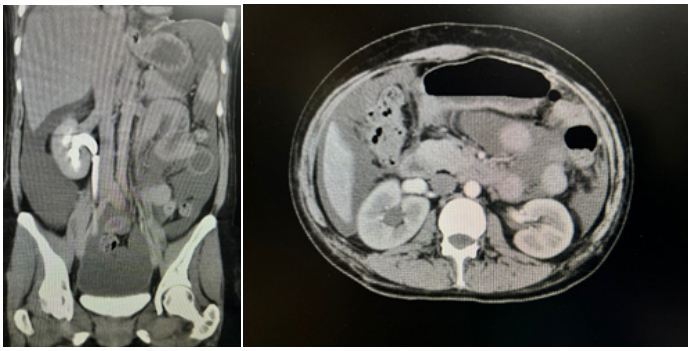

**Image 3:** Urotomography with contrast - preoperative: grade II hydronephrosis of the right kidney. Pelvic and right ureteral calyceal dilation. Lack of continuity in the distal third of the right ureter. Free fluid in abdominal cavity. Left kidney without alterations.

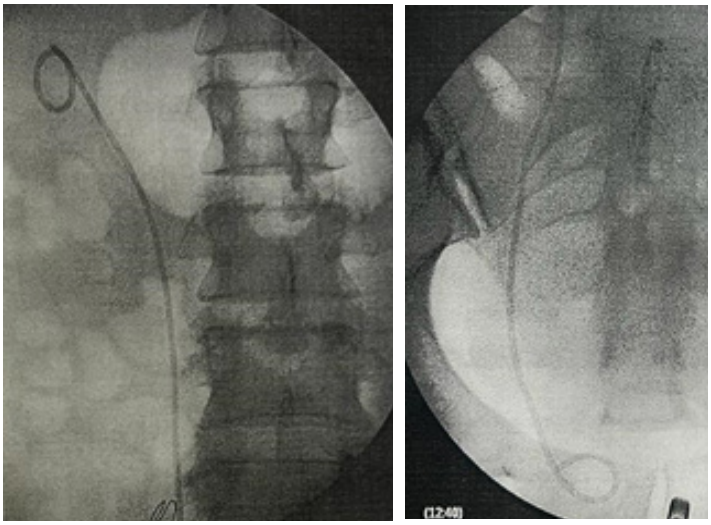

**Image 4:** Placement of 2 PIGTAIL COOK Firm 4.7 x 24 cm under cystoscopic and fluoroscopic guidance in the right ureter. The image shows the proximal 1/3 and the distal 1/3 of the right ureter.

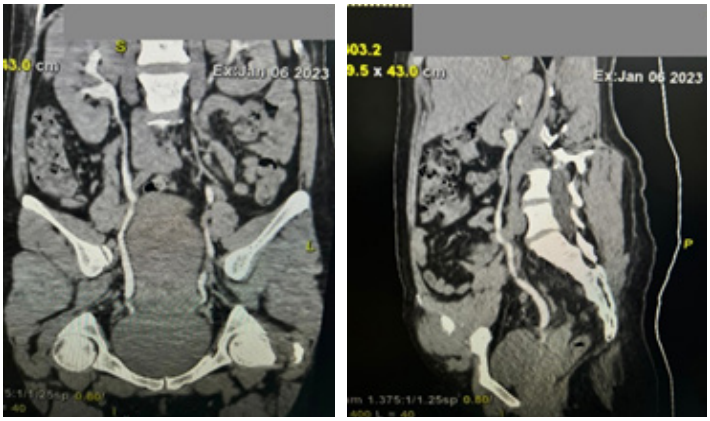


**Image 5:** Postoperative contrast-enhanced urotomography: normal ureters, with good passage of contrast, without narrowing, kidneys with preserved anatomical characteristics.

## Discussion

The introduction of the ureteral catheter in 1967 revolutionized the way to manage urinary tract obstructions, becoming one of the most used accessories in urology.

Pigtail or also called double J, is a small caliber flexible probe with multiperforated curvature at both ends, which prevents displacement. It is placed using a retrograde transurethral endoscopic technique, placing one end in the renal pelvis and the other in the urinary bladder. Its function is to ensure the passage of urine from the kidney to the bladder in the ureter obstructed by multiple causes such as: ureteral lithiasis, tumor strictures, surgical and inflammatory causes, and ureteral fistulas [8].

In a hospital in China, a prospective study was carried out from October 2009 to May 2013 and found that 12 patients (11 women and one man, with an average age of 48.8 years) had iatrogenic

lesions in the lower ureter, suffered during gynecological or urological procedures. Of the total number of patients, 8 cases were due to radical hysterectomy, 3 occurred after resection of rectal cancer, and one occurred after resection of a uterine tumor. In patients with ureteral injury due to gynecological and urological procedures, a Pigtail was placed. The follow-up of the patients at 4 months, after the removal of the STENT, revealed normal ureters without obstruction or stenosis, evaluated by intravenous pyelography, which implied the efficacy of this surgical technique [9].

In a hospital in Spain, a double J catheter was placed in a woman with urinoma due to a posterior ureteral lesion, product of an abdominal hysterectomy with double adnexectomy due to endometriosis. The catheter was removed 1 month later, and the evolution was favorable without complications in the postoperative period. After 1 year, a control was carried out with evidence of good renal function and normal urinary tract in tomography [10].

Based on what has been stated in the scientific literature and the good results we obtained with our patient, we can recommend the use of a double J catheter (PIGTAIL) in patients with ureteral lesions, since it is a well-tolerated procedure and less traumatic than other surgical techniques [6,8-10].

## Conclusion

1. Most ureteral injuries are due to an iatrogenic cause, laparoscopic or open secondary surgical procedures, with hysterectomy being the procedure with the highest risk of ureteral injury.
2. The best treatment for ureteral injury is prevention. The surgeon must be familiar with the anatomic relationship between the ureter and the posterior peritoneum. Before surgery, a carefully preoperative study must be done, analyzing the patient's images to distinguish the relationship between the proximal, middle, and distal ureter, with the psoas major, uterine artery, and internal iliac artery.
3. We believe that the use of a double J or PIGTAIL catheter is useful in patients with grade 1 and 2 ureteral lesions.

## References


1. Nnabugwu I, Amu O. Iatrogenic ureteric injuries complicating open obstetric and gynaecologic operations in Southeast Nigeria case series. J West Afr Coll Surg. 2011; 1: 98-108.
2. Ali MA, Maalman RSE, Oyortey MA, et al. A 6-year retrospective clinical review of iatrogenic ureteric injuries repaired in a resource-deprived setting. BMC Surg. 2022; 22: 380.
3. Engelsgjerd JS, LaGrange CA. Ureteral Injury. Stat Pearls. Treasure Island FL Stat Pearls Publishing. 2022.
4. Gild P, Kluth LA, Vetterlein MW, et al. Adult iatrogenic ureteral injury and stricture–incidence and treatment strategies. Asian J Urol. 2018; 5: 101-106.
5. Burks FN, Santucci RA. Management of iatrogenic ureteral injury. Ther Adv Urol. 2014; 6: 115-124.
6. Chen JC, Zhu S, Ren L, et al. Treating ureteric obstruction secondary to gynecological disease assisted with retrograde ureteroscopic stenting. European Review for Medical and Pharmacological Sciences. 2017; 21: 5330-5336.
7. Nabavizadeh B, Keihani S, Hossein S, et al. Insertion of a single double-J stent for bilateral open ureteral reimplantation introducing a novel technique and assessment of feasibility. Int Urol Nephrol. 2016; 48: 1015-1019.
8. Uthappa MC, Cowan NC. Retrograde or antegrade double-pigtail stent placement for malignant ureteric obstruction. Clin Radiol. 2005; 60: 608-612.
9. Zongyao Hao, Li Zhang, Jun Zhou, et al. Minimally Invasive Management of Iatrogenic Ureteral Injuries with Ureteroscope Facilitated by Holmium Yttrium-Aluminum Garnet Laser. Department of Urology. The First Affiliated Hospital of Anhui Medical University and Institute of Urology. Anhui Medical University. Hefei 230022 China. 2014.
10. Chamorro J, Gutierrez S, Suarez M. Urinoma due to ureteral iatrogenesis. Arch Esp Urol. 2008; 61: 624-626.


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