



Anuria : Causes and Mangement in Casablanca

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Abstract

Introduction: Obstructive anuria represents a medico-surgical emergency that requires early diagnosis and its management is well codified and standardized based on emergency collaboration between urologist and nephrologist depending on the severity of the clinical picture. In this study, the most common causes are neoplastic or lithiasic obstructions, and retroperitoneal fibrosis

Patients and methods: We carried out a descriptive cross-sectional study with retrospective data collection from April to July 2018 and prospective from August 2018 to March 2019. This involved the study of the files of patients hospitalized in the urology department of the Chu ibn Rochd of Morocco. Our study included all adult patients with bilateral or single upper excretory tract obstruction in a single anatomical or functional kidney associated with one of the three KDIGO criteria.

Results: We consulted 4143 hospitalization records, 123 (0.029%) had acute obstructive renal failure, only 93 including 58 women and 35 men met our inclusion criteria. The average age was 59.2 years old. The average consultation time was 7.9 days. The circumstances of discovery were oligo-anuria (41.9%), low back pain (25.8%) anuria, and renal colic (20.4%) hematuria (8.6%). It was discovered incidentally in 3.3% of cases. The diversion was mainly performed by percutaneous nephrostomy in 74.2% of patients and by JJ probe in 25%.

Conclusion: Pelvic cancers represent the most common etiology, hence the importance of a complete clinical examination with pelvic examinations and CT without injection. Prevention is based on the early diagnosis of these cancers. The prevalence of obstructive anuria was significant at 0.029% and its overall lethality at 5.3%.

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Introduction

Acute renal failure is universally defined according to the 2012 KDIGO guidelines (Kidney Disease/Improving Global Outcome) as (1):

- Stage 1: increase of more than 26 micromoles of creatinine in 48 hours or increase of more than 50% in 7 days with a diuresis < 0.5 mL/kg/h

- Stage 2: doubling of creatinine with diuresis < 0.5 mL/kg/h for more than 12h
- Stage 3: a tripling of creatinine or increase of more than 354 micromoles if no previous value is known

The obstructive nature is due to a bilateral obstacle on the upper excretory tract or unilateral on only one kidney. Obstructive anuria represents

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a medico-surgical emergency that requires early diagnosis and its management is well codified and standardized based on emergency collaboration between urologist and nephrologist depending on the severity of the clinical picture(2).In this study, the most common causes are neoplastic or lithiasic obstructions, and retroperitoneal fibrosis (3). The vital prognosis involved in the short term and the comorbidities related to obstructive anuria justify a descriptive study to improve patient management and reassessing standards.

Patients and methods

We carried out a descriptive cross-sectional study with retrospective data collection from April to July 2018 and prospective from August 2018 to March 2019. This involved the study of the files of patients hospitalized in the urology department of the Chu ibn Rochd of Morocco.Our study

included all adult patients with bilateral or single upper excretory tract obstruction in a single anatomical or functional kidney associated with one of the three KDIGE criteria (1).All incomplete files and all re-hospitalizations during the study period were excluded. The selection of the files was made using a counting sheet, the size of our sample was 93.The clinical data collected were vital signs, location of pain, associated neurological and digestive symptoms, and pelvic examination. Upon admission, all the patients had a renal-vesical ultrasound (**figure 1**) with or without a CT scan without injection. A dosage of serum creatinine, serum urea, serum potassium, and CBC were requested.The variables analyzed were: gender, age, consultation times, clinical data, paraclinical examinations, type of derivation, etiology, and complications. The same variables were collected retrospectively and prospectively.

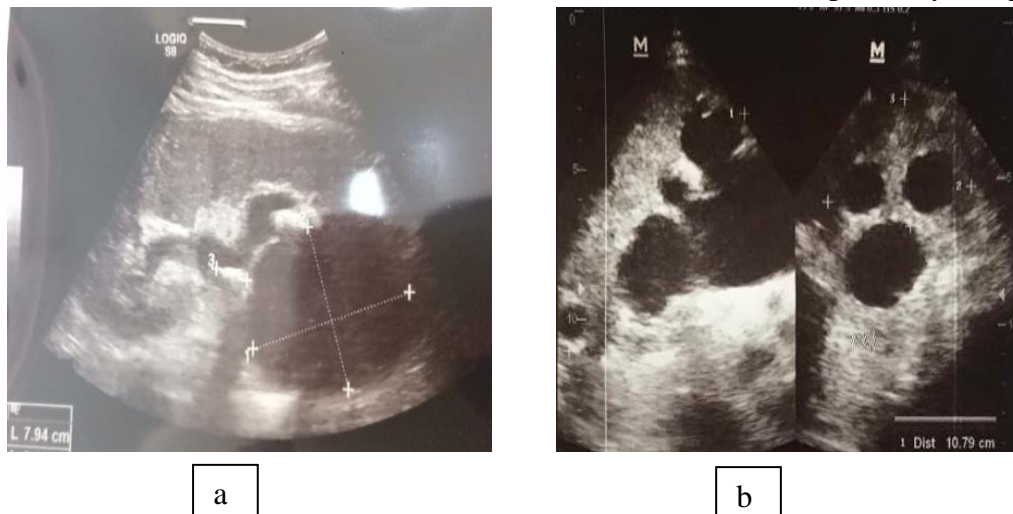


Figure 1: Large obstructive parapelvic cyst complicated by pyelic and caliceal stones in a single anatomical kidney (a). Major pyelocalicial dilation laminating the cortex (b)

The standard technique of raising the JJ probe by retrograde endoscopic approach under general anesthesia or spinal anesthesia with retrograde uretero-pyelography was used (**Figure 2**).An abdominal X-ray was performed on day 0 or day 1 postoperatively in all patients with surgical success.Daily control of serum creatinine was carried out from postoperative day 1 in patients. We then noted either:

- An improvement: drop serum creatinine of at least 10 units at the 48th-hour control

- Normalization: normalization of serum creatinine.
- No improvement: stationary creatinine.
- Aggravation: an increase in the serum creatinine figures of more than 10 units at the 48-hour control in the absence of aggravating factors (anemia, dehydration, and urinary infection).
- A slow improvement: a drop in numbers between 5 and 10 units in 48 hours.

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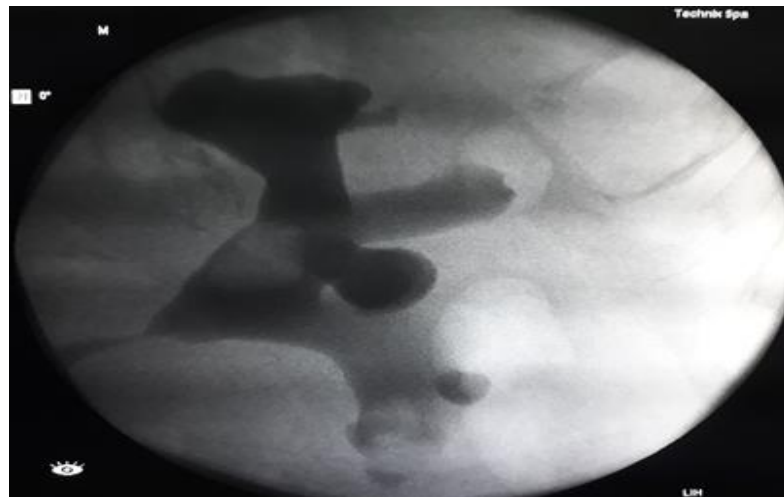


Figure 2: Retrograde uretero-pyelography showing narrowing of the junction with pyelic and inferior calicallithiasis complicating a parapyloric cyst in a single anatomical kidney

A change of JJ was made after worsening. Diversion by nephrostomy was ultrasound-guided under local anesthesia.

- Locally advanced neoplastic pathologies with ureter infiltrations or pelvic shielding in the first intention.
- After failure to mount JJ: JJ probe not mounted in the renal cavities.
- Worsening in patient-derived by double JJ.

Anterograde pyelography was performed after diversion by nephrostomy to study the level of obstruction (figures 3a and 3b).

Statistically, to facilitate the calculations, all the patients who underwent primary nephrostomy in whom the double JJ was subsequently placed were considered to have been derived by nephrostomy.

Data processing and analysis were done using EPI info and Excell 2016 software. Chronic renal failure (CRI) is defined as renal damage or a glomerular filtration rate (GFR) <60 ml/min/1.73 m² for 3 months or more, regardless of the cause. The time of consultation is defined as the period between the onset of symptoms and the time of consultation of the health service.

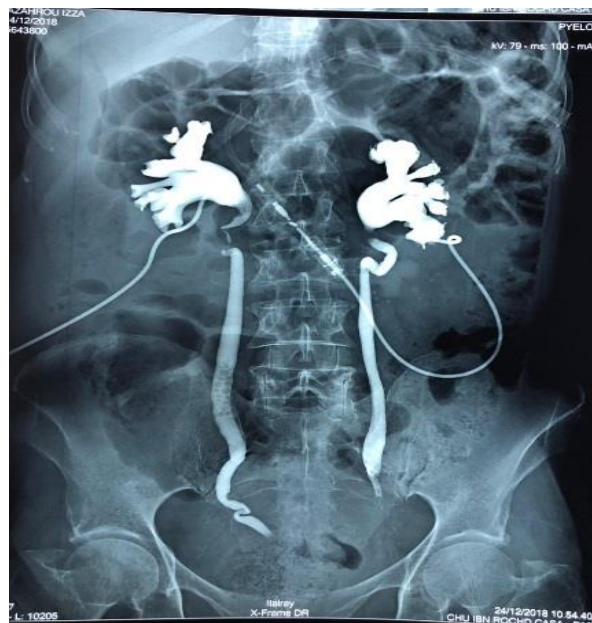


Figure 3a : pyélographie descendante objectivant un arrêt au niveau des uretères pelviens

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Figure 3b: retrograde pyelography showing an arrest at the leftpyelo-urethraljunction. Proximal to the right urethra.

Results

We consulted 4143 hospitalization records, 123 (0.029%) had acute obstructive renal failure, only 93 including 58 women and 35 men met our inclusion criteria. The sex ratio F / M was 0.6 with a female predominance.

The average age was 59.2 years old with extremes of 38 and 80 years old. The average consultation time was 7.9 days. The circumstances of discovery were oligo-anuria (41.9%), low back pain (25.8%) anuria, and renal colic (20.4%) hematuria (8.6%). It was discovered incidentally in 3.3% of cases .

The WHO performance status was rated at 2 at least in 41% of cases. Pyelocaliciel dilation was found in all cases, 17.2% of patients had dedifferentiated kidneys on ultrasound. Obstruction was bilateral in 86% of patients and single in 14% of patients. The rate of chronic renal failure was 3.2%. Renal failure with serum creatinine above 100mg/l was observed in 80.6% of patients. Hyper uremia was seen in all cases.

Mean serum potassium was 5.4mmol/L with a maximum value of 8.3mmol/L.

Serum potassium above 6.5 mmol / L in 25.8% of our patients and 18.2% of them had undergone extrarenal purification. Anemia was observed in 34.4% of our patients and 9.7% of patients had been transfused in per dialysis.

Cervical cancer was mainly represented (45%) followed by bladder cancer. Rare causes accounted for 8% of etiologies (**table I**). Figure 5 summarizes the overall etiologies of obstructive anuria. The percentage of metastases was 19.7% or: 8.4% of bladder cancers; 7.1% of prostate cancer and 4.2% of cervical cancer. In 71.5% it was stage IIIB cervical cancer (**Table II**).The diversion was mainly performed by percutaneous nephrostomy in 74.2% of patients and by JJ probe in 25% (**Table III**). We did not observe complications related to the mounting of JJ, on the other hand, for the patients derived by nephrostomy, we have 7.9% (5 cases) of macroscopic hematuria without repercussion on the hemodynamic state of immediate occurrence after the gesture

Table I: Breakdown of patients followed for obstructive renalfailure according to etiology

ETIOLOGIES	EFFECTIFS	%
Cervical cancer	39	41,94%
Bladder cancer	20	21,51%
Renallithiasis	14	15,05%
prostate ADK	7	7,53%
FRP	4	4,30%
ADK Rectal	2	2,16 %

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SJPU	2	2,15%
GIST	2	2,15%
Kyste Para pyélique	1	1,08%
Urogenitaltuberculosis	1	1,08%
Undetermined	1	1,08%
Grand total	93	100%

Table II: staging of patients with cervical cancer

Stade des cancers du col	Effectifs	%
IIIB	28	71,8%
IVA	8	21 ,5%
IVB	3	6,7%
TOTAL	39	100%

Table III: distribution of patients according to the diversion method

DERIVATION URINAIRE	EFFECTIFS	%
JJ	24	25,81%
NEPHROSTOMIE	63	67,74%
NEPHROSTOMIE+JJ	5	5,38%
URTEROSTOMIE	1	1,08%
TOTAL GENERAL	93	100,00%

The evolution was marked by normalization of renal function after 5 days in 80.62%. The occurrence of an obstacle removal syndrome in 20.2% of cases, and 5.3% of death cases. Eight patients (8.6%) were declared chronic renal failure during their hospitalization and 5.2% had a slow improvement. On D5, 57 patients (i.e. 90.7% of patients derived by percutaneous nephrostomy) had normalized renal function compared with 18 (i.e. 75% of patients derived by JJ). These rates go from 90% for the JJ versus 95% percutaneous nephrostomy when we subtract the 07 patients declared chronic renal insufficiency including 4 derived by JJ and 3 by nephrostomy.

Urolithiasis represented 50% of patients declared chronic.

Discussion

Obstructive or post-renal anuria corresponds to renal insufficiency due to acute obstruction of the urinary tract at the supra-bladder level, occurring bilaterally or in a single anatomical or functional kidney (3). It represents 10% of all cases of kidney failure. It is particularly common in the elderly, due to the high incidence of pelvic tumors

(4).The average age in our series was 59.2 years with extremes ranging from 38 to 80 years. The gender ratio was 0.6 with a female predominance. The tissue consequences of the obstruction are correlated with the duration of the obstruction, its degree, and completeness or not (5). Acute obstruction of the excretory pathway leads to increased pressure upstream in the renal tubules and a collapse of glomerular filtration (3).This results in water and sodium, nitrogen (urea and creatinine), potassium (hyperkalemia), phosphorus, and uric acid retention which can be life-threatening in the short term. In the absence of rapid removal of the obstacle, irreversible lesions of the renal parenchyma may appear and be responsible for permanent chronic renal failure (6). The average consultation time in our study was 7.9 days. This was slightly higher than that of the Malagasy study (7) which took 4.4 days. A study carried out in Benin (8) reported a very long delay of 90 days. This relatively rapid delay in the use of health services in our study is explained by the fact that 95.7% of our patients had a medical assistance plan.

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The circumstances of the discovery of obstructive anuria vary according to the patient situation, the site of the obstacle, the speed of installation, and the complete or incomplete nature of the obstruction.

Oligo-anuria was the most common mode of revelation in 41.94% of cases followed by low back pain in 25.84% of cases. In 20.43% of our patients, the anuria was associated with renal colic. These results were divergent from those of the Beninese study which reported mainly anuria in 80.95% followed by oligo-anuria in 19.04% and lumbar pain in 18 cases (42.85%). The often progressive evolution of neoplastic pathologies (predominant in our study) would explain the incomplete nature of the obstruction at the beginning of the disease and therefore the predominance of oligoanuria.

The diagnosis of obstructive anuria is retained on the clinical data in the absence of diuresis and the absence of bladder globe. Imaging examinations make it possible to specify the etiology and to locate the obstacle exactly (9). The first-line radiological examination prescribed is ultrasound, the sensitivity of which for diagnosing an obstructive origin in the presence of renal failure is around 85%. It had made it possible to confirm the obstructive origin by the emptiness of the bladder and the visualization of pyelocalicel dilation as in all our patients. There are, however, 5-10% false negatives when the pyelocalicel cavities are not dilated due to dehydration and at the very beginning for cavities that are not very compliant (10). The existence of an obstacle to the flow of urine associated with a KDIGO criterion is sufficient for the diagnosis of acute obstructive renal failure. In our study, 80.64% of patients had renal insufficiency with serum creatinine above 100mg/L. These results are similar to those obtained by F RAKOTOTIANA et al who reported serum creatinine above 100mg/L in 85.71% of cases (7). Hyper uremia was found in all cases. The severity of renal insufficiency in more than three-quarters of our patients was explained by an average consultation time a little late at one week. Significant thinning of the renal cortex is observed on D7, sometimes with disappearance of the papilla (3). These consequences are correlated with the severity of the renal failure. Renal failure on a single anatomical kidney represented 13.98% of the cases in our study. Serum potassium was above

6.5 in 25.80% of our patients and 18.21% of them had benefited from extrarenal purification. Indications for hemodialysis are generally limited to Acute oedema of the lungs, impaired consciousness, hyperkalemia threatening the short-term vital prognosis. The etiology was in almost all cases suspected from the clinical examination or during radiological explorations performed during surgical drainage. They were dominated by pelvic cancers which represented 73% of the causes (cervix, bladder, and prostate). Urolithiasis was the 2nd cause of acute renal failure and the 1st cause of chronic renal failure in our study by data from the **literature** (11). These results are similar to those reported by F.Sallusto et al who found cancer as the cause of AKI in 50% of cases and lithiasis in 40% of cases (2). A.F RAKOTOTIANA et al reported a frequency of pelvic cancers of 47.29% followed by lithiasis in 42.85%. B. Dassouli et al (12) reported 18 years ago in Casablanca 43% of lithiasis against 29% of pelvic cancer. Cervical cancer was the most represented in 41.94% of cases followed by bladder tumors in 15% of cases unlike the Beninese study (4) which reported more prostate tumors (42.30%) than the cervix (2.5%). The high incidence of cervical cancer (12.8%) in Morocco, which ranks 2nd after breast cancer in terms of all cancers, women being more affected than men (13), and a large number of women would explain the predominance of cervical cancers in our study. We found rare causes of obstructive anuria such as pelvic gastrointestinal stromal tumors (GIST), pyelo-urethral junction syndrome (SJPU), and urogenital tuberculosis respectively in: 2.15%; 2.15%, and 1.08% of cases.

In an emergency, once the causal pathology was known, the choice of urinary diversion was made taking into account the subsequent therapeutic plan (14). In our study, percutaneous nephrostomy was performed as first-line treatment for locally advanced neoplastic pathologies with ureteric infiltration or pelvic shielding. The problems related to changes in double JJ and its long-term complications, such as calcareous encrustation and uretero-iliac fistulas, mean that they are not used as first-line treatment in the event of a tumor (14)(15)(16). On the other hand, the rise of the double probe JJ was carried out in the first place for lithiasis of the urinary tree for which ureteroscopy was planned and for neoplastic pathologies for which the pelvis was free in

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patients whose radical treatment is planned in the short term. The predominance of neoplastic pathologies (73%), in this case locally advanced neo-cervical disease at the urinary stage with an overall rate of metastasis of 19.7%, reasons for anesthesia and failure of catheterization JJ would explain also the preponderance of drainage of the excretory tract by percutaneous nephrostomy.

The evolution was marked by the normalization of kidney function after 5 days in 80 patients (86.02%). Thirteen patients had a slight improvement (14.2%), these were patients with chronic background: they had consulted late, were anemic, and whose kidneys were dedifferentiated on ultrasound. Eight patients (8.6%) of them were declared in chronic renal failure during hospitalization. An obstacle removal syndrome was observed in 20.22%. All these patients in hyper diuresis were in anemia, had a good renal cortex and 15.05% had consulted in the short time. The therapeutic management of SLO consisted of the administration of solutes to compensate for hydroelectrolyte losses, without perpetuating the polyuria as recommended by the **literature** (17) (18). The observed deaths were related to thromboembolic complications in neoplastic patients with hemodialysis catheters.

It is very illusory to compare drainage by NPC to that of JJ because the number of patients derived by percutaneous nephrostomy is also larger. The caliber of the nephrostomy probe is larger than that of JJ. Drainage quality also depends on the state of the renal parenchyma and the state of hydration. Regardless of the underlying pathology, hydration status, and caliber of the probe used, 90% of patients derived by JJ had normalized renal function at D5 versus 95% for percutaneous nephrostomy

Conclusion

Pelvic cancers represent the most common etiology, hence the importance of a complete clinical examination with pelvic examinations and CT without injection. Prevention is based on the early diagnosis of these cancers. Percutaneous nephrostomy was used more than double-J probes because locally advanced neoplastic pathologies predominate. The prevalence of obstructive anuria was significant at 0.029% and its overall lethality at 5.3%.

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