URINOMA: A POTENTIAL UROLOGIC EMERGENCY

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URINOMA A POTENTIAL UROLOGIC EMERGENCY (Abstract): **Aim:** A urinoma is characterized as a collection of urine outside the urinary tract as a result of disruption of the collecting system induced by a high pressure in the collecting system **Material and methods:** We reviewed the medical records of all patients with urinoma treated in the Iasi Urology Clinic between January 1, 2013 and March 1, 2017 Results**:** A total of 36 patients, (18 males and 18 females), age between 18-70 years with an average age of 51.10 years, were included. The etiology of obstruction was represented by lithiasis 29 (80.55%) cases, pelvic cancers 5 (13.88%) cases, pyelonephritis 1 (2.78%) case and trauma 1 (2.78%) case. The size of lumbar collection was between 1 cm (n=19) and 28 cm (n=1). The interval from symptom onset to presentation was: 6-10 hours - 12 (33.33%) cases; 12-24 hours - 17 (47.22%) cases, up to 5 days - 7 (19.44%) cases. The treatment was represented by the insertion of a double J stent in 29 patients, percutaneous nephrostomy in 5 (13.88%) patients. Two (5.5%) patients were treated conservatively. The post-operative evolution of patients was favorable. The ultrasound examination before discharge revealed no collection in 34 (94.44%) patients and the presence of urinoma in evident remission in 2 (5.56%) cases. Eight (22.22%) of our patients had positive urine culture with *E. coli* (n=4), *Enterococcus spp*. (n=2), *Klebsiella spp*. (n=1) and *Pseudomonas* (n=1). Six (16.66%) of our patients had infected urinoma which needed drainage of lumbar collection. **Conclusions:** Urinoma is a rare complication secondary to ureteral obstruction and it has a high risk of infection. All the cases must be investigated in hospital, double-J stent insertion and antibiotic therapy is the most frequent treatment option but some selected cases can be treated conservatively **Keywords**: URINOMA, LITHIASIS, DOUBLE-J STENT.

Urinoma is a pathological situation in which the patient presents an encapsulated collection of extravasated urine, usually located in the perirenal space but at times found in the retroperitoneal space, peritoneal cavity, pleural cavity, and even in the mediastinum (1). Urinoma is secondary to ureteral obstruction with cause a high pressure above the obstacle, but the exact mechanism is not fully understood.

The etiologies for spontaneous urinary extravasation from the upper urinary tract are: caliceal fornix extravasation and ureteral (or peripelvic) rupture. The former is caused by a sudden increase in renal pelvis pressure and backflow of urine into the

renal sinus in case of obstruction. This is considered to be a protective physiological mechanism producing decompression that may protect the kidney from high-pressure injury (1).

In patients with obstructive uropathy, there is often a sharp rise in intrapelvic pressure and the collecting system may rupture at its weakest location-the fornix. Being relatively rare, this phenomenon has not been systematically studied.

Urinomas in children are rare and secondary to obstructive uropathies, such as posterior urethral valve, pelviureteric junction, and/or vesicoureteric reflux.

The diagnosis of the urinoma, although uncommon, is important for emergency physicians because it needs a specialized urological service where to admit and to offer special treatments to the case.

The treatment of perirenal extravasation should be individualized. Conservative follow-up, endoscopic treatment, percutaneous urinary drainage, and surgical correction of obstruction have all been suggested depending on the underlying cause and amount of extravasated fluid.

MATERIAL AND METHODS

In this retrospective study, the medical records of all patients with urinoma admitted and treated in the Iași Urology Clinic between January 1, 2013 and March 1, 2017 were reviewed. Diagnosis was performed by ultrasound and fore some cases by CT scan. Data on age, presence and degree of ureterohydronephrosis (UHN), imagistic dimensions of the urinoma, etiology, time from symptom onset to presentation and treatment method were collected.

RESULTS

Between 2013-2017, 36 patients, 18 males and 18 females were diagnosed with urinoma. The age of the patients was between 18-70 years with an average age of 51.10 years. All patients had UHN, the UHN's degree was I-II (out of V) in 28 cases and III-IV in 8 patients.

TABLE I.
Dimension of urinoma measured by ultrasound

Size (cm)	No. of patients
<1	19
2	7
3	3
7	1
10	3
11	2
28	1

The etiology of obstruction was represented by lithiasis 29 (80.55%) cases, pelvic cancers 5 (13.88%) cases, pyelonephritis 1 (2.78%) case, and trauma 1 (2.78%) case (figure 1). Of this patient 17 (47.22%) had urologic history (1 stone wave lithotripsy, 6 nephrostomies and 10 ureteral stents indwell). Eight (22.22%) of our patients had positive urine culture, most encountered bacteria were *E. coli* (n=4), followed by *Enterococcus spp.* (n=2), *Klebsiella spp.* (n=1) and *Pseudomonas* (n=1). Six (16.66%) of our patients had infected urinoma which needed drainage of lumbar collection.

The interval from symptom onset to presentation was: 6-10 hours - 12 (33.33%) cases; 12-24 hours - 17 (47.22%) cases, up to 5 days - 7 (19.44) cases. The treatment was represented by the insertion of a double J stent in 29 (80.55%) patients, percutaneous nephrostomy in 5 (13.88%) patients and 2 (5.55%) patients were treated conservatively. The post-operative evolution of patients was favorable. The so-

nographic examination before discharge revealed no collection in 34 (94.44%) patients and the presence of a collection but with smaller size in 2 (5.56%) cases.

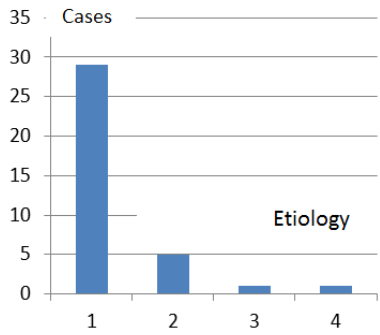

Fig. 1. Etiology of urinoma
(Legend: 1- lithiasis, 2- pelvic cancer, 3- pyelonephritis, 4- trauma)

DISCUSSION

Urolithiasis is a disease with an increased incidence and prevalence worldwide. Although rare, urinoma is one of the possible complications of urolithiasis. According to Pampana *et al.* (1) perforation could occur at any level from the calix to the bladder but it is usually seen at the fornices and upper ureter. It may lead to several serious consequences including urinoma, abscess formation, urosepsis, infection, and subsequent irreversible renal impairment. This leads to the necessity to early intervene in the presence of urinoma by performing urgent double-J stent insertion, nephrostomy tube insertion, or in some cases ureteroscopy with stone extraction.

The mean age of patients in our group was 51.10 years, which is very similar as the one of Gershman's (2) group of 108 patient which was 52.3 years. Regarding the male: female ratio in our group was 1:1but in other studies was 7:3 (2, 3).

In our study, the etiology of obstruction was represented by lithiasis (80.55%) followed by pelvic neoplasms (13.88%). Urolithiasis was also the main cause of obstruction in studies of Gershman and Almujalhem (2, 3). Rare etiologies for urinoma were also described. These include obstruction because of posterior urethral valves (5), gravid uterus (6), iatrogenic causes (7, 8), pelvic-ureteric junction (PUJ) obstruction (9), vascular extrinsic compression (10, 11), i. v. fluid administration (12), bladder carcinoma (13), retroperitoneal fibrosis, vesical-ureteric junction obstruction (2).

Most of our patients (80.55%) were evaluated in the first 24 hours of symptoms onset, but urinoma usually does not have a specific symptom, although Doehn *et al.* (14) states that one of the specific manifestations of forniceal rupture is the sudden pain relief due to the decrease in collecting system pressure. Sometimes this situation could not be differentiated from a renal colic but sometimes could mime an acute abdomen. In our study, the patients had no atipic symptoms, most of them declared lumbar pain and the first ultrasound examination diagnosed the lumbar collection.

Most of cases reported in the literature have a delayed diagnosis due to the gradual onset of symptoms, including loin pain and sepsis (when they become infected). Pain in the loin and infection are commonly thought to be the effects of pyelonephritis, and ultrasound is an appropriate first-line investigation to exclude hydro nephrosis or collections.

Contrast-enhanced CT has an increase specificity regarding diagnostic because urine flow into the fluid collection can be

documented by increased attenuation in the collection on delayed images but imaging alone is not able to distinguish between a urinoma and other types of fluid collection (15, 16).

In some cases, the diagnostic could be very difficult due to lack of symptoms. Diamond and Marshall (4) reviewed 34 patients with spontaneous urinary extravasation, and nine of these patients were treated through exploratory laparotomy for acute abdominal conditions. In this situation, imagistic evaluation of the patient is very important. According to Moak *et al.* (15) and in our case, ultrasonography represents the first line of investigation for renal colic.

The most important treatment is to deal with the underlying condition that led to the urinomas formation in the first place (16). Nephrostomy or stenting is needed in cases caused by leakage without obstruction such as in traumatic injuries or postoperative anastomotic dehiscence. If the urinoma is small, it may not need to be drained separately. The urine may reabsorb if further flow into the urinoma has been eliminated.

When obstruction of the urinary system causes the urinomas, the obstruction needs to be relieved.

Urinoma drainage is indicated in several situations. Fever or leukocytosis, suggesting that the urinoma is infected is good reason to proceed to drainage. The urinoma may need to be drained to reduce pain or pressure on adjacent structures (16).

In our study only 8 (22.22%) had positive urine cultures, most frequent bacteria were *E. coli*. This percent is high compared with results of Gershman et. al. in which case only 5.2% had a documented urinary tract infection, but lower as the percent obtained by Doehn *et al.* which was 27.4%. This author also noticed that more than half of the patients had systemic signs of

infection such as leukocytosis (54.3%) and/or elevated C-reactive protein level (61.5%).

According to Doehn *et al.* (14) urinoma is a potential urologic emergency due to the reported risk for perinephric abscess formation and urosepsis that carry high morbidity rate. The author performed in all patients, primary endoscopic therapy (internal drainage) (96.3%) or insertion of a nephrostomy tube (3.7%) and concluded that with a low-pressure system and antibiotic treatment, the outcome is excellent, and secondary complications can be effectively prevented. Therefore, minimally invasive procedures or conservative care offer excellent results, and several case reports confirm this.

We performed insertion of a double J stent in 29 (80.55%) patients, percutaneous nephrostomy in 5 (13.88%) patients with good results, taking into consideration same clinical elements (general condition, fever, risk of infection, renal function, inflammatory elements, the initial cause of UHN). No collection was revealed in 34 (94.44%) patients before discharge. The conservative treatment was applied only in 2 (5.55%) cases. In some cases, this can be an option. Kalafatis *et al.* (17) treated 35 (41%) of 81 cases in a conservative approach (bed rest, intravenous fluid, and antibiotic) and concluded that conservative management can be applied to certain patients with fornix rupture. Also, Almujalhem (3) treated conservatively 57.5% of patients and concluded that that conservative management is a valid option of treatment of noncomplicated cases of spontaneous fornix rupture.

CONCLUSIONS

In our study, we find that urinoma is a rare complication of ureteral obstruction which affect both males and females, often secondary to lithiasis and can become a potential urologic emergency, Risk of infection and evolution to abscess is high and leads to the necessity to early intervention to decompress the collecting system. Ultrasound may detect fluid collections in the perinephric or retroperitoneal areas, but is recommend contrast CT to confirm the diagnosis.

Fluid around the kidneys, ureters, or bladder may represent extravasated urine, and further imaging may be necessary to characterize injuries fully.

Double-J stent insertion is the primary endoscopic therapy with good results. Some selected cases can be treated conservatively.

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