

## URINARY TRACT DESOBSTRUCTION IN PATIENTS WITH MALIGNANT NEOPLASMS OF THE UTERINE CERVIX

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### **Summary**

Cancer of the cervix causes internal, external compression or both of the upper urinary tract in 50-60% of patients in advanced stages. Retrograde stenting is the most widely used technique for desobstruction of the upper urinary tract in urology practice. Diversion of urine flow is an alternative, achieved by nephrostomy of one or both kidneys. We studied retrospectively 33 women with upper urinary tract obstruction caused by carcinoma of the uterine cervix operated on between March 2014 and March 2015 in the urology clinic at the University Hospital in Pleven, Bulgaria. A percutaneous nephrostomy (PNS) was placed in 17 patients, and 11 patients had a retrograde catheterization with ureteral stent type JJ. Five patients were treated with both methods. Placement of a JJ stent was the first choice procedure for all patients since it provides a better quality of life. PNS improves renal function faster than retrograde JJ stenting. Therefore, the first method of choice for patients with an untreated primary cervical, uterine cancer is the placement of PNS. Retrograde JJ stenting is the method of choice in patients who undergo surgery and radiation therapy without a relapse of the disease.

**Key words:** obstruction of upper urinary tract, percutaneous nephrostomy, retrograde ureter stenting, desobstruction

### **Introduction**

Cancer of the cervix worldwide occupies the second place among all malignant neoplasms of the female genitalia. According to the national cancer registry, it is fourth in frequency and accounts for 7.2% of all malignant diseases in women in Bulgaria [1].

The incidence of cervical cancer increases with age and reaches its peak in the 50-54-year-olds. About 2/3 of the patients (64.3%) are diagnosed in the initial (first and second) stage of the disease, and 17.1% are diagnosed in the third and fourth stage (Figure 1) [1].

Tumor growth causes internal and external compression of the upper urinary tract due to a proximity of the anatomical structures in the pelvis.

Obstruction of the upper urinary tract during the pathological process is observed in 50-60% of patients with malignant neoplasms of the female sexual organs in advanced stages (Figure 1) [2].

Blockage can be unilateral or bilateral and can vary in severity depending on the degree of hydronephrosis.

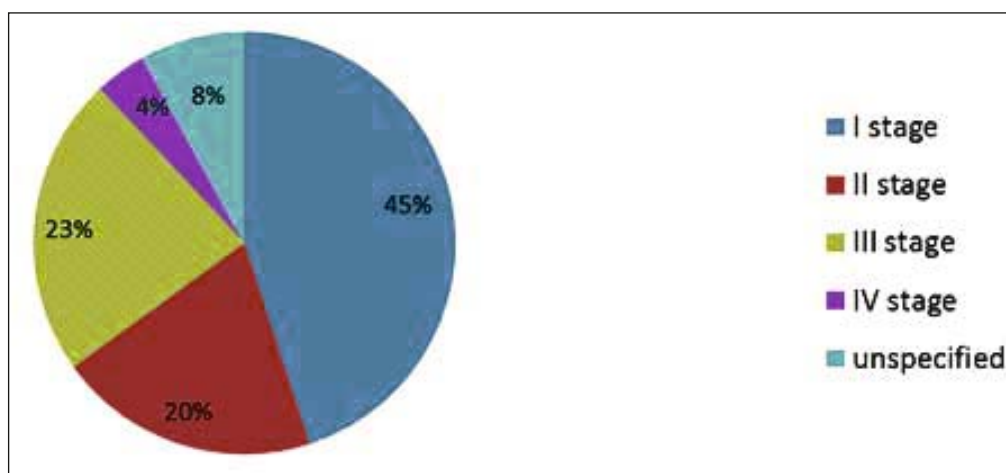
Obstruction may be due not only to the invasion of the tumor into the ureter, but to external compression of available pelvic metastases, recurrence, and radiation fibrosis.

If both the ureters are involved, oligo- or anuria develops, leading to azotemia and fluid and electrolyte imbalance, which deteriorates

general condition and may even result in coma and death. For these reasons, a preoperative dialysis should be performed in preparation for surgery. A postoperative hemodialysis is also administered for a faster recovery of the patient.

The retrograde stenting is the most widely used technique for unclogging the upper urinary tract in urology practice. If this method fails, an alternative is a derivation of urine, achieved by nephrostomy of one or both kidneys.

The objective of this study was to evaluate the efficacy of the two methods of desobstruction of the upper urinary tract in cases of cancers of the uterine cervix.



**Figure 1.** Distribution by stage of newly diagnosed cases of cancer of the cervix according to the national cancer registry 2013

## Materials and Methods

The retrospective study included 33 women, of average age 53 years. They were operated on between March 2014 and March 2015 at the Urology Clinic at the University Hospital in Pleven. All patients had upper urinary tract obstruction caused by carcinoma of the uterine cervix. Of these, eight patients had been diagnosed with malignant neoplasm for the first time in our clinic, 14 had had surgery and radiotherapy for cervical cancer, and 11 had proven relapse after treatment. The patients were divided into three groups according to the signs of obstruction (Figure 2).

The hematological (hemoglobin, hematocrit, erythrocytes, leucocytes) and biochemical (creatinine, urea, uric acid, electrolytes) tests, and tests of urine (pH, specific gravity, albumin,

sediment, urine culture) before and after the intervention were performed.

Upper urinary tract obstruction and the degree of hydronephrosis were diagnosed by imaging techniques – transabdominal ultrasound, venous urography, retrograde ureterography, and computed tomography.

Ureteral stent type JJ was inserted by cystoscopy and ureteroscopy. Operating procedures were controlled by ultrasonography and X-ray of the urinary system.

For the placement of nephrostomy tube, we used the percutaneous ultrasound-guided technique of Seldinger. It included subcostal needle puncture below the 12<sup>th</sup> ribs at the posterior axillary line, targeting lower calyx under ultrasound control. Through the needle, we put the guide wire and then we inserted a nephrostomy catheter over the guidewire.

The patients with isolated microorganisms with a microbial number over  $10^5$ /ml were treated according to the antibiograms. The others

received the prophylactic treatment with a broad spectrum antibiotic.

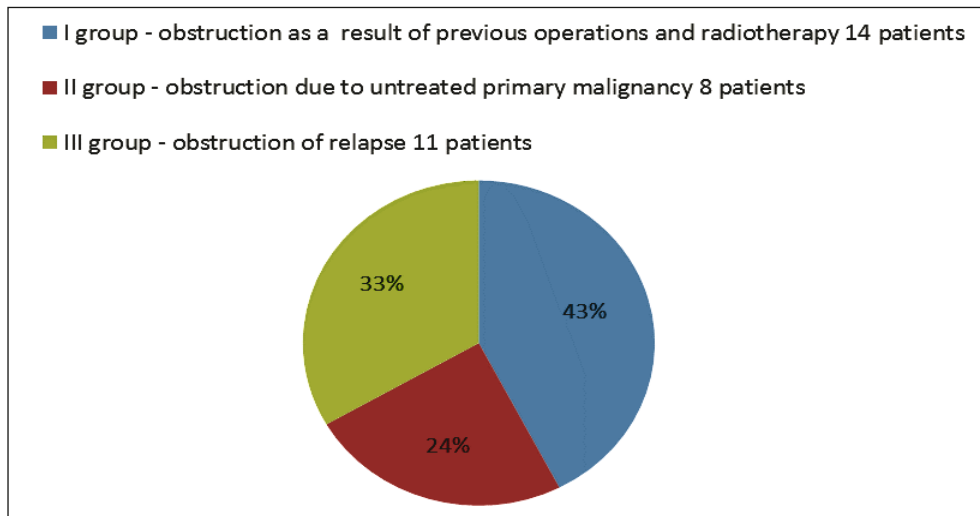


Figure 2. Distribution of patients in groups

## Results

All patients had high levels of blood urea and creatinine, and acid-base and electrolyte imbalance. Twenty-one of the patients had

bilateral hydronephrosis, and 12 had unilateral hydronephrosis.

In eight of the patients with bilateral hydronephrosis, a preoperative dialysis for renal failure was performed (Figure 3).

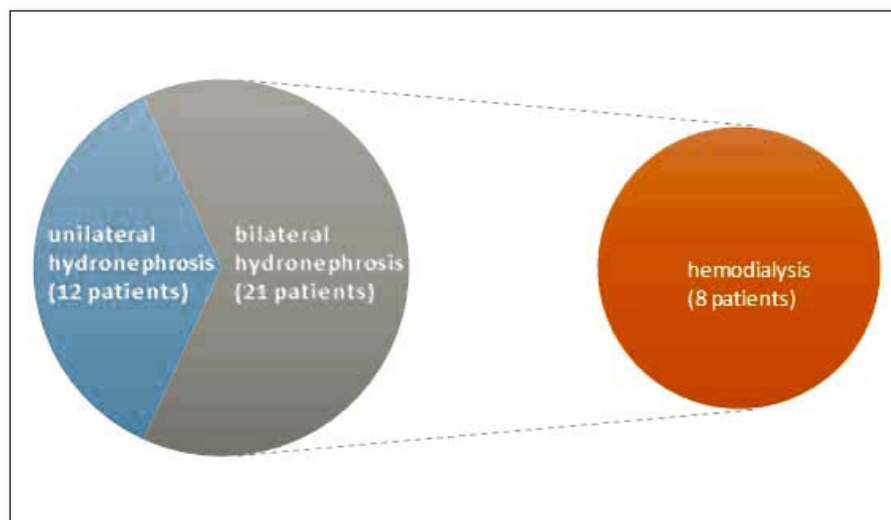


Figure 3. Distribution of patients, according to obstruction (unilateral or bilateral) and performance of hemodialysis

A percutaneous nephrostomy (PNS) was placed in 17 patients, and 11 patients had a retrograde catheterization with ureteral stent type JJ (Figure 4). Five patients were treated with both

methods.

Postoperatively, serum creatinine levels dropped to nearly normal concentrations in all patients during the hospital stay (Figure 5).

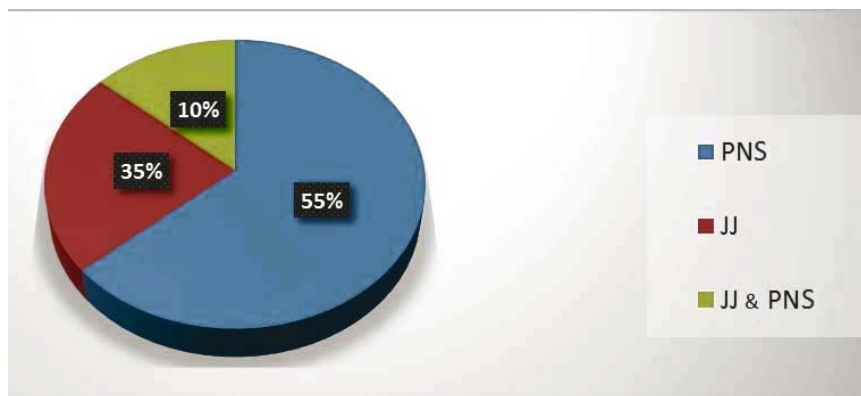
Clearance was faster for patients with PNS, as compared with patients with JJ stents. Significantly higher initial levels of creatinine in patients with PNS should be noted.

Placement of a JJ stent was the first-choice procedure for all patients since it provided a better quality of life. The success rate in groups

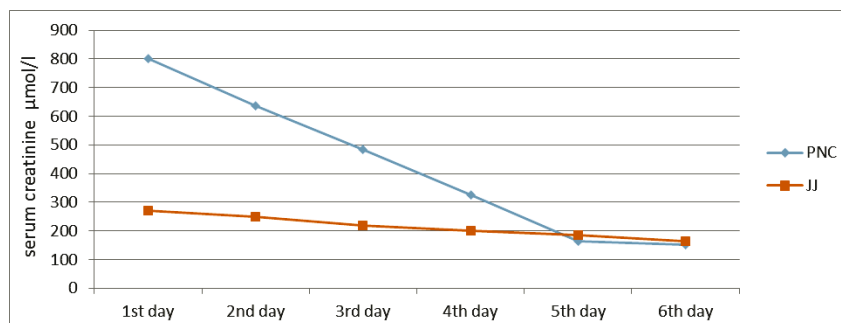
was:

- 72% success rate in I group
- 12% success rate in II group
- 45% success rate in III group

Significant complications, greater than grade 2 of Clavien-Dindo classification, after the procedures occurred in 5 patients (Table 1).



**Figure 4.** Distribution of patients according to methods used



**Figure 5.** Depurative ability of methods during the hospital stay

**Table 1.** Complications in various drainage procedures

Complications in the different procedures	Endoscopic standing (JJ)	Percutaneous nephrostomy
hematuria	0	2
pararenal hematoma	0	0
infection of the urinary tract	1	2
migration and dislocation of the prosthesis	1	2
incrustation and clogging	2	0
rupture of pyelocalyx system and urinoma	0	1
injury of the big vessel	0	0
reoperation	3	3

**Discussion**

Open surgery for desobstruction of the upper urinary tract before the advent of minimally

invasive urological and imaging techniques was accompanied by massive operative trauma, slow recovery, prolonged hospital stay and impaired quality of life.

The first report of PNS by Goodwin & Associates was published in 1955. Since then, PNS has been indicated in patients with unilateral or bilateral obstruction of the ureters, where retrograde catheterization is impossible [3].

Placement of a JJ stent was first described in 1967 by Zimskind and associates. It was the most commonly used method in urology practice for the drainage of the upper urinary tract [4]. Many authors prefer retrograde stenting of the ureter, but it is often impossible due to anatomical deformities, bleeding, external or internal compression caused by malignant tumors. Failure of retrograde catheterization in 40% to over 80% of cases was described in patients with obstruction, caused by malignant neoplasms [5, 6]. Our results were similar – failure rate of JJ stenting was 68% (Group I+Group II). The alternative treatment is PNS, which is a proven method for the derivation of the urine of the upper urinary tract and improving renal function. The rate of complications observed in PNS varies with different authors, although the method is minimally invasive. Mortality for PNS procedure is up to 0.3%, and minor complications (I and II) by the Clavien-Dindo classification range from 15% to 20% [7-9]. A significant complication rate (grade>II) was observed in 15% of our patients, but no mortality was registered.

According to our results, drainage of an untreated primary malignancy should be done through PNS, due to the low success rate of JJ retrograde stenting. There was a 12% success rate in II group. In treated patients without relapse of the disease, we would recommend JJ retrograde stenting: the success rate in I group was 72%.

Drainage of the upper urinary tract is part of the treatment for patients with cancer of the female reproductive organs. Our study confirmed the need for a multidisciplinary team of oncogynecology specialists, radiotherapists, chemotherapists, urologists, and nephrologists to approach such a complex pathology.

## Conclusions

For patients with carcinoma of the uterine cervix, JJ ureteral stent and PNS improve kidney function. PNS improves renal function faster than retrograde JJ stenting. The first method of choice for patients with an untreated primary cervical uterine cancer is the placement of PNS. For patients given surgery and radiation therapy without a relapse of the disease, the method of

choice is retrograde JJ stenting. Adequate drainage of the upper urinary tract in patients with cancer of the uterine cervix improves their health and quality of life.

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