
Original article

Obstructive Nephropathy as a Result of Malignant Neoplasms: A Single Centre Experience

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Abstract

Introduction. The aim of our study was to assess the significance of the problem of obstructive nephropathy as a result of malignant diseases in a single nephrology centre.

Methods. The medical histories of patients hospitalized at the Clinic of nephrology, Faculty of Medicine in Skopje, due to malignant disease associated with obstructive nephropathy during January 2000-May 2003, have been retrospectively analyzed.

Results. Out of 42 patients with obstructive nephropathy due to malignancies, the obstruction was a result of cervical carcinoma in 12(28.6%), bladder tumor in 9(21.4%), colorectal tumor in 7(16.7%), prostate cancer in 7(16.7%), endometrial cancer in 4(9.52%), ovarian in 2(4.7%) and lymphoma in 1 patient (2.4%). Double J stent has been inserted in only 5 patients (11.9%) and percutaneous nephrostomy in 14(33.3%). Hemodialysis was discontinued in 8(19%) patients after a successful urinary diversion. In 6 patients (14.3%) maintenance hemodialysis followed after ineffective urinary diversion. Seventeen patients (40,5%) were not adequate for urinary diversion and remained on maintenance hemodialysis and 7 (16.7%), independent of urinary diversion, but all with reduced renal function, had no need for dialysis. All the patients with percutaneous nephrostomy experienced some kind of complications, the most frequent being dislodgment of the tube, obstruction and bleeding (42.8%, 21.4 and 21.5% respectively). Out of 19 attempts, only 5 have been successful in placing double J stent, and only one patient had urosepsis. Hemodialysis was associated with ileofemoral thrombophlebitis in 4 patients (17.4%), and only one patient (4.3%) had catheter associated sepsis.

Conclusion. Hemodialysis is a safe method to relieve signs and symptoms of obstructive nephropathy due to malignancies and may provide a relatively fair quality of life, but is costly and should not be considered if a timely endourologic procedure is possible as palliative treatment for obstructive nephropathy due to malignancies.

Key words: complications; hemodialysis; malignancies; obstructive nephropathy; urinary diversion

Introduction

Three terms are used to describe a disease as a consequence of urinary tract obstruction: obstructive uropathy, obstructive nephropathy and hydronephrosis, but each in different connotation. If ureteral dilatation due to impaired flow of urine is associated with renal parenchymal damage, it is described as obstructive nephropathy [1]. Obstructive nephropathy as a result of malignant neoplasms (ONM) is becoming increasingly a great problem for urologists and nephrologists, and is one of the major emergencies in urology and oncology. The obstruction may be caused by prostate cancer, bladder cancer, colorectal, cervical, uterine, ovarian, testicular tumor, embryonic tumor, lymphoma, and metastatic breast cancer. Two to three percent of the cases with obstructive nephropathy may be benign, as a result of a previous radiation therapy. It is a result of ureteral stricture and usually has a long latent period of 14 years (10-21 years). The malignant obstruction develops in a much shorter period, usually one month, but sometimes might occur as late as after 14 years. It is either due to spread of the primary tumor in the pelvic cavity, or recurrence of the tumor, or due to enlarged metastatic lymph nodes close to the ureters. If the obstruction occurs gradually and in a long term, then cortical atrophy of the kidney ensues, leading to deterioration of renal function and uremia.

Despite advancements in surgical techniques, radiotherapy and chemotherapy for treatment of urogenital malignancies, these neoplasms often progress with obstructive nephropathy due to local spreading or pelvic metastases and if the obstruction is not removed, the patient's clinical conditions will deteriorate at a fast pace through uremia, water-electrolyte abnormalities and urinary infections with a consequent reduction of alertness and subsequent death. Retrograde ureteral clearing with double-J ureteral stents is

the most widely used technique for relieving obstructions of the urinary tract, but as it is frequently impossible in cancer patients due to the presence of anatomic deformities, bleeding or ureteral compression, percutaneous nephrostomy (PNS) is the method of choice. Ultrasonography has made this procedure safe and effective obtaining immediate improvement in the biochemical and laboratorial parameters of renal function. Although simple, PNS can be associated with complications leading to significant morbidity. Therefore, in patients with poor prognosis, the indication for PNS is more complex [2].

Most frequent complications associated with ureteral diversion are dislodgment, kinking, blockade and infection from nephrostomy tubes and failed reinsertion of double-J [3]. Sometimes bleeding at the nephrostomy and even haemorrhagic shock is possible.

Many urologists and radiologists have found no difference in clinical efficacy between placing retrograde ureteral stenting and PNS [4].

The aim of the study was to assess the significance and the scope of the problem of obstructive nephropathy as a result of malignant diseases at the Clinic of nephrology in Skopje by assessment of hospitalized patients with ONM in the period of January 2000-May 2003.

Patients and Methods

All the medical histories of patients hospitalized at the Clinic of nephrology due to malignant disease associated with obstructive nephropathy during January 2000-May 2003, have been retrospectively analyzed. A total of 42 patients have been admitted to hospital due to ONM within this period. Obstructive nephropathy has been diagnosed by ultrasound, intravenous pyelogram or computerized tomography, and the malignancy by histopathologic confirmation prior to hospitalization. The type of malignancy, presence of obstruction (uni- or bilateral), the urologic diversion, nephrologic therapy and complications associated with urologic diversions are summarized in tables. All the patients with ONM were admitted to the Clinic of nephrology either for severely reduced glomerular filtration rate and requirement for urgent hemodialysis, or due to failed attempt for placing double J stent by a urologist, and at the same time having been assessed by nephrologist as progressors toward uremia and need for subsequent hemodialysis. In all the patients that have been assessed adequate for PNS while hospitalized

at the Clinic of nephrology, the nephrostomy has been placed either by a nephrologist or gastroenterologist under the guidance of ultrasound.

Results

A total of 42 patients have been diagnosed to have ONM within the study period. Male-female ratio was 20:22. Mean age of patients was 60.4 years (range 29-85 years).

Presentation of ONM according to tumor site and type

Out of 42, in 12 patients (28.6%) the obstruction was a result of cervical carcinoma, followed by 9(21.4%) with bladder tumor, 7(16.7%) with colorectal tumor, 7(16.7%) prostate cancer, 4(9.52%) endometrial cancer, 2(4.7%) ovarian cancer and 1(2.4%) lymphoma).

Table 1 shows the treatment procedure prior to hospitalization and type of obstruction. Only 26.2% have been operated and have their tumor removed and have undergone irradiation. In the majority of patients with ONM, 88.2%, the obstruction was a result of malignant spread.

Table 1. Type of treatment before hospitalization and type of obstruction

Type of treatment	Number of patients (% of total)
Surgical treatment	22(52.4)
Radiation treatment	20(47.6)
Surgery + radiation	11(26.2)
Without surgery or radiation	11(26.2)
Type of obstruction	
	5(11.9)
Benign obstruction	[latency 5.75years; 3-276 months] 37(88.1)
Malignant obstruction	[latency 12.8 months: 0-96 months]

Urinary diversions

Out of 42, in only 5(11.9%) double J has been successfully inserted, and in 14 patients, the attempt failed. In 14 patients (33.3%) percutaneous nephrostomy has been placed. Surgical diversion has been performed in only 2 cases (4.8%) (Table 2).

Table 2. Urinary diversions, hemodialysis and outcome in hospitalized patients with obstructive nephropathy

Primary tumor	JJ- stent n (%)	PNS n (%)	Surgical diversion n (%)	Remained on HD n (%)	Died n (%)
Cervical n=12	1(8.33)	3(25)	1(8.33)	6(50)	1(8.33)
Bladder n=9	1(11.1)	3(33.3)	1(11.1)	3(33.3)	1(11.1)
Colorectal n=7	2(28.6)	5(71.4)	0	4(57.1)	1(14.3)
Prostate n=7	0	1(14.3)	0	4(57.1)	0
Endometrial n=4	0	1(25)	0	3(75)	1(25)
Ovarian n=2	0	1(50)	0	2(100)	0
Lymphoma n=1	1(50)	0	0	1(100)	0
Total n =42	5(11.9)	14(33.3)	2(4.8)	23(54.8)	4(9.5)

Patient outcome regarding renal function

Out of 42, 23(54.8%) patients remained on maintenance hemodialysis, independent of whether urinary diversion has been performed or not. Out of them, hemodialysis was inevitable in 8 patients prior to urinary diversion, and it was discontinued in all after a successful urinary diversion (19%). Six patients (14.3%) where the urinary

diversion had been ineffective remained on maintenance hemodialysis. Seventeen patients (40.5%) were not adequate for urinary diversion and therefore remained on maintenance hemodialysis. Seven patients (16.7%) independent of whether urinary diversion has been performed or not, all with reduced renal function, had no need for dialysis (Table 3).

Table 3. Patient outcome regarding renal function after management of obstruction

Treatment and outcome	Cervical n=12	Bladder n=9	Colorectal n=7	Prostate n=7	Endometrial n=4	Ovarian n=2	Lymphoma n=1	Total n=42(%)
HD before UD; Without HD after UD	1	3	2	1	1	0	0	8(19)
With UD, but remained on HD	2	0	2	0	0	1	1	6(14.3)
No UD Remained on HD	6	3	1	4	2	1	0	17(40.5)
With or without UD, no need for HD	2	2	1	2	0	0	0	7(16.7)
Died	1	1	1	0	1	0	0	4(9.5)

Complications of urinary diversions In a total of 14 patients, PNS have been placed, and all of them experienced some kind of complication: in 6 dislodgment occurred and the PNS had to be replaced, in 1 urosepsis was the final outcome, in 3 obstruction of the percutaneous tube, in 3 bleeding and in 1 the attempt to place a PNS failed. In only 5 patients a retrograde double-J stent has been successfully placed. In 14 patients the attempt to place a double-J stent failed, and in one patient with double-J stent, urosepsis occurred. A total of 23 patients remained on maintenance hemodialysis. Out of these 23, in only 4 ileofemoral thrombophlebitis occurred, and in 1, catheter-associated urosepsis (Table 4).

Table 4. Complications associated with urinary diversions and hemodialysis

Treatment	Complications	Patients n=42 (%)
PNS (14 pts)	◆ movement/dislodgement	6 (42.8)
	◆ urosepsis	1 (7.2)
	◆ tube obstruction	3 (21.4)
	◆ bleeding	3 (21.4)
	◆ failed attempt	1 (7.2)
JJ-stent (19 pts)	◆ failed attempt	14 (73.7)
	◆ urosepsis	1 (5.3)
HD (23 pts)	◆ ileofemoral thrombophlebitis	4(17.4)
	◆ catheter associated sepsis	1 (4.3)

PNS-percutaneous nephrostomy, HD-hemodialysis, UD-urinary diversion

Causes of death

Four patients (9.5%) died during hospitalization. Causes of death were pulmonary oedema in two patients who have undergone surgical therapy for the primary tumor (no urinary diversion, treated by hemodialysis only), liver insufficiency in one patient with metastatic liver disease (palliative surgery of the primary tumor, obstruction of the JJ-stent and hemodialysis), and sepsis in 1 patient (only radiation for the primary tumor, no urinary diversion, treated by hemodialysis).

Four patients out of the remaining have been taken home by family members in a very poor general condition. One patient have been transferred to the Reanimatology clinic in hemorrhagic shock as a result of severe bleeding from the nephrostomy, and a total of 7 patients have been transferred to Gynaecology or Urology for surgical procedure of the primary tumor or palliative surgery.

Discussion

If obstructive uropathy resulting from malignancy is not timely and effectively treated, it may progress to uremia, electrolyte imbalances, persistent urinary infections and death. Reports from literature show a poor prognosis of these patients with a median survival of 3 to 7 months. This accentuates the importance of quality of life (QOL) in these patients. QOL is very often poor additionally, after urinary diversions, due to frequent complications (tube movement and dislodgement, leaking, bleeding etc.) and moreover, placing a PNS or urinary stent may not necessarily resolve the obstruction, thus requiring hemodialysis in the end [5]. We observed complications in our study group associated with placement of PNS to a certain

extent. But, the procedure was carried out under guidance of ultrasound only. Carrafiello *et al.* [6] reported no major complications associated with placement of PNS, 14.4% dislodgements, 1.33% rupture of the catheter and 0.67% kinking of catheters, but the procedures were carried out under ultrasound and fluoroscopy. We observed some kind of complications in all the 14 patients with placement of PNS in our study: 42.8% dislodgements, 21.4% obstruction of the percutaneous tube, 7.2% urosepsis, 21.4% bleeding and 7.2% failure to place the PNS. Shekarriz *et al.* [7] also reported high percentage of complications after endourologic palliative urinary diversion (stent or nephrostomy), 68.4% in patients with advanced malignancy and obstructive nephropathy. They also had a high failure rate for primary endourologic procedures and additional procedures were required. Pappas *et al.* [8] on the other hand, reported highly successful and effective desobstruction in patients with ONM, 99% success rate with PNS and 81% with antegrade ureteral stenting. Both procedures have been performed under ultrasound and radiologic guidance in his study. Only 6% of patients had no improvement of renal function, and the rest returned to normal, or significantly improved and had no need for dialysis. Hyppolite *et al.* [9] out of 34 patients with obstructive uropathy due to gynecological malignancy and renal failure (obstructive nephropathy) in a 5-year period, reported that 7 had stent catheter placement and 86% of them developed urosepsis, 17 had PNS (uni-or bilateral) with no complications and renal failure was reversed, and only 6% were dialyzed. They concluded that PNS was a superior procedure for ONM. On the other hand, Wong *et al.* [10] in his study of 102 patients with ONM, concluded that in spite of improved technical success of decompression, subsequent complication rate was still high in these patients, particularly if they had therapy after decompression, and one of the factors associated with inferior overall survival was placement of PNS.

In our study, 45.5% of patients had urinary diversions (33.3% of total had PNS) and the success rate was only 19%. In 19% of patients, hemodialysis was discontinued after urinary diversion, but high number of patients left on maintenance hemodialysis (54.8%). This is the highest percentage of patients treated by hemodialysis compared to other studies (3, 6-10). It might be probably a result to the selection of patients. The study analyzes hospitalized patients in a nephrology clinic where all of them had already obstructive nephropathy with some extent of renal failure. Therefore, the complication rate associated with placement of ureteral stents and PNS was high. But, only 4.3% of patients on hemodialysis (1 patient) had catheter associated urosepsis, and 17.4% had minor complications that were overcome.

As the study analysis patient medical histories retrospectively, sufficient additional data are lacking to clarify the causes why these patients have not timely undergone endourologic procedures. It can be speculated that comorbidities might be partly a cause of late referral to a urologist, as well as patient incomppliance. But, also, one can not dis-

regard a possibility of inadequate cooperation among gynecologists, surgeons, oncologists and urologists.

Conclusion

Hemodialysis is a safe method to relieve the signs and symptoms of obstructive nephropathy due to malignancies, but is costly. Concerning the poor prognosis these patients have and the high percentage of complications associated with endourologic palliative urinary diversions, hemodialysis as palliative therapy to relieve symptoms of uremia is obligatory, but only where all the other endourologic procedures fail. In order to reduce the number of patients with obstructive nephropathy as a result of malignancies on maintenance hemodialysis, establishing a good and devoted team consisting of surgeons, oncologists, urologists and nephrologists is required. Careful follow-up of these patients might enable timely referral to urologist for endourologic procedure, less complications and prevention of loss of renal function followed by maintenance hemodialysis.

Conflict of interest statement. None declared.

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