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Nephrology

Problems of the Management of Obstructive Nephropathies of Tumor Origin at the "Luxembourg" Chu

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Abstract **Original Research Article**

This is a retrospective study covering a period from January 2020 to December 2022, the main objective of which was to identify the problems of management of tumor-related obstructive nephropathy at the Luxembourg University Hospital. We included 79 patients from 240 cancer cases. The hospital admission rate was 32.91%, the mean age was 56.37 years, ranging from 19 to 82 years; the sex ratio was 0.83, favoring women. Cervical cancer was the most common type (32.9%). The usual reason for consultation was elevated serum creatinine (73.4%); deterioration in general condition and pain were the main clinical signs (50.6%). Anemia (42%) and ionic disorders such as metabolic acidosis (19%) were frequently encountered; CT scan was systematically performed in all patients in our study; Palliative surgery and chemotherapy were performed in 70.88% and 68.35%, respectively; Obstacle removal was observed in 22.8% of patients in our study; Hemodialysis was performed in 67% of patients and 49.05% of these 67% were receiving chemotherapy. The prognosis under hemodialysis was poor with 39.24% deaths and 15.18% stability. The main causes of these deaths are late diagnosis, insufficient technical facilities and lack of knowledge of cancer by the population.

Keywords: Problem, obstructive nephropathy, tumor process.

INTRODUCTION

The problems related to the management of tumor processes have currently become a global health and economic challenge. However, these tumor processes are among the leading causes of morbidity and mortality worldwide. In 2012, there were approximately 14 million new cases and 8.2 million deaths related to tumor processes, representing 14% of deaths. It is estimated that this number of new cancer cases per year worldwide is expected to increase from 14 million in 2012 to approximately 22 million in 2030 [1].

This mortality from these tumor processes is proportionally high in Africa than elsewhere in the world; they represent 10 to 20% of pathologies on the African continent [1].

In Africa, late diagnosis makes management difficult and allows the distinction of several situations of renal damage ranging from acute renal failure to chronic renal failure due to prolonged hypertension in the urinary tract. Acute renal failure is a common and severe complication in oncology patients due to the nephrotoxicity of anticancer drugs [2].

Indeed, with an incidence ranging from 12 to 49% in patients admitted to intensive care, oncology patients appear to be at greater risk of acute renal failure than other intensive care patients [3].

In our experience, acute renal failure is present upon admission in 12 to 42% of oncology patients and dialysis is required in 9 to 32% of these patients [3].

The incidence of obstructive renal failure is higher and its prognosis more reserved than in the general population, however the pathophysiological mechanisms of this renal failure are identical to those of acute renal failure occurring in other areas [3].

In Mali, the problems of management of tumor processes (lack of knowledge of cancer, lack of access to specialized care, shortage of anticancer drugs, financing

of chemotherapy and insufficient specialized personnel) mean that patients are seen with complications due to metastases [4]. In addition to these problems, we observe frequent renal damage during tumor processes, more specifically in pelvic tumors. However, the management of late-discovered renal failure is based, among other things, on palliative chemotherapy, rarely radiotherapy, surgery, hormone therapy and often even hemodialysis. The aim of this work is to identify the problems of management of tumor-related obstructive nephropathy at the Luxembourg University Hospital

PATIENTS AND METHODOLOGY

This is a descriptive, retrospective study conducted in the Nephrology and Hemodialysis Department of the Luxembourg University Hospital (CHU) between January 2020 and December 2022 (a three-years period).

- The records of patients with renal failure due to a pelvic tumor were selected.
- Data were collected from usable medical records and the hospital software "CINZAN" using a pre-established survey form.
- Data entry and analysis were performed using SPSS version 21.0.

RESULTS

We collected 79 cases of obstructive nephropathy from 240 cases of renal failure due to tumor processes in the nephrology and hemodialysis department of the Luxembourg University Hospital.

Sociodemographic Data:
Gender:

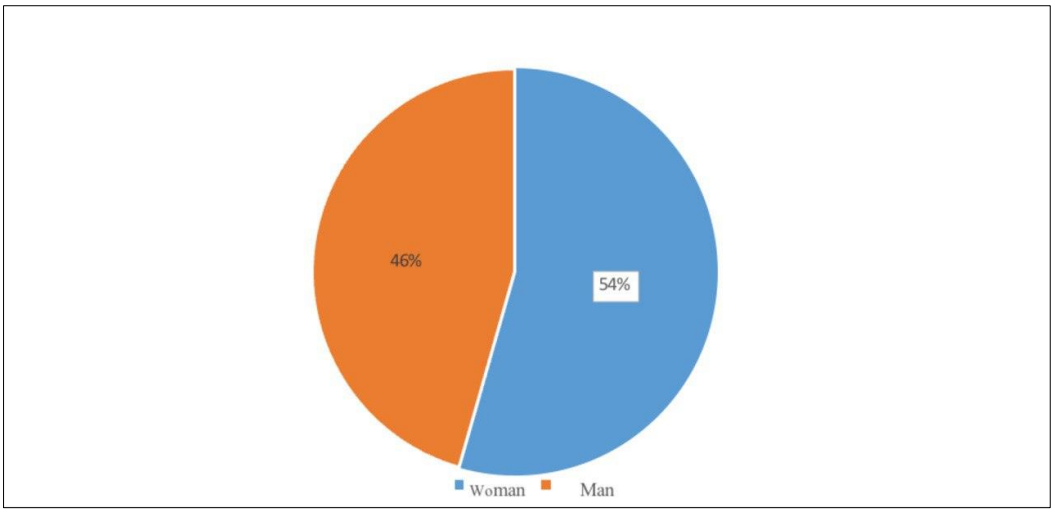

Figure 1: Distribution of patients by gender

Females were the most prevalent, at 54%.

Age:

Table 1: Distribution of patients by age group

Age of the patients	Number	Percentage%
[19-39]	12	15,18
[40-60]	32	40,50
[61-80]	34	43,03
>80	1	1,26
Total	79	100

The age group [61-80] was the most represented, at 43.4%.

Ethnicity:

Table 2: Distribution of patients by ethnicity

Ethnicity	Number	Percentage %
Bambara	25	31.64
Soninké	20	25.31
Peulh	16	20.25
Sorrhai	5	6.32

Khassokha	3	3.8
Tamasheq	3	3.8
Mianka	3	3.8
Diawondo	1	1.3
Bwa	1	1.3
Malinké	1	1.3
Bozo	1	1.3
Total	79	100

The Bambara ethnic group had the highest percentage at 31.64%.

Profession:

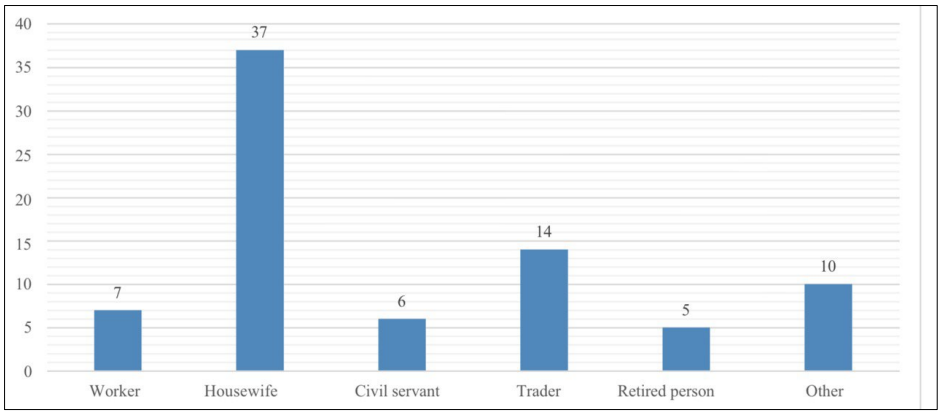

Figure 2: Distribution of patients by occupation

In our series, housewives were the most represented, with 46%.

Residence:

Table 3: Patient Distribution by Residence

Residence	Number	Percentage%
Bamako	46	58,2
Outside Bamako	33	41,8
Total	79	100

The majority of our patients resided in Bamako, 58.2%.

Clinical Data
Medical History:

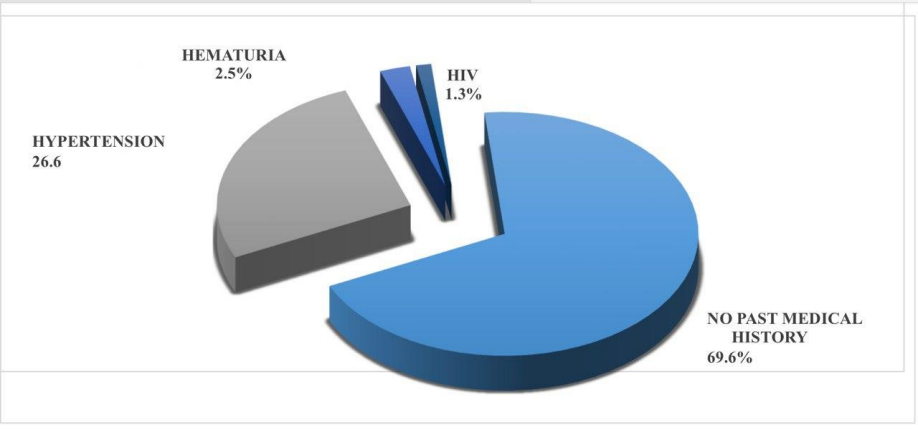

Figure 3: Distribution of patients by medical history

Patients' medical history varied, but 70% of patients had no known medical history.

Reason for consultation:

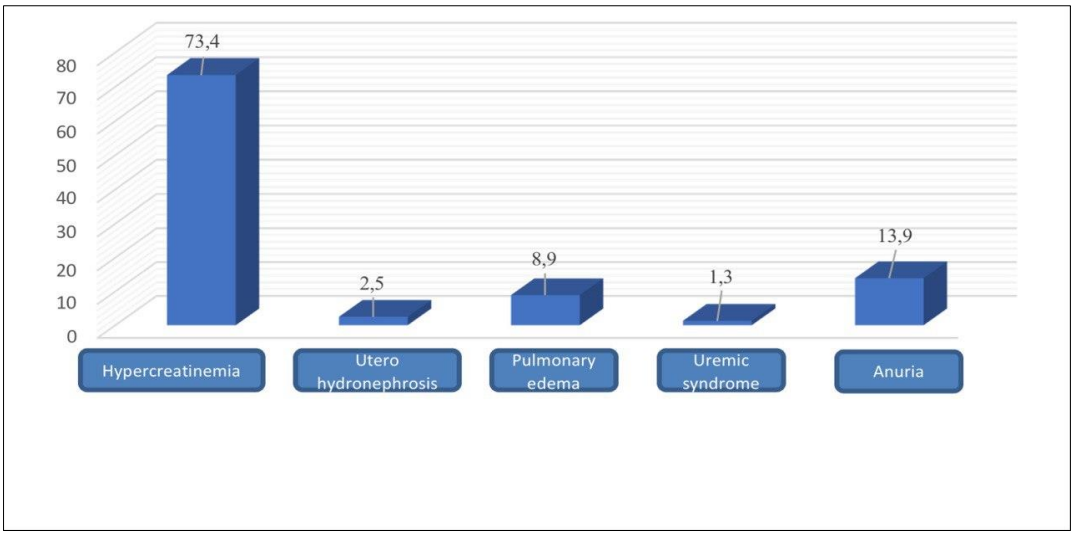

Figure 4: Distribution of patients by reason for consultation

Elevated serum creatinine was the most notable reason for consultation, at 73.4%.

Primary Tumor:

Table 4: Distribution of patients according to the frequency of the primary tumor

Primary Tumor	Number	Percentage %
Cervical cancer	**26**	**32.9**
Colorectal cancer	20	25.3
Bladder cancer	17	21.5
Prostate adenocarcinoma	12	15.18
Ovarian cancer	3	3.79
Peritoneal carcinomatosis	1	1,3
Total	**79**	**100**

Cervical cancer represented the highest percentage of primary tumors in our series, at 32.9%.

Time of discovery of renal failure in relation to the primary tumor:

Table 5: Distribution of patients according to the time of discovery of renal failure in relation to the primary tumor

Detection of renal failure	Number	Perrcentage %
Before tumor diagnosis	5	6.32
At the time of tumor diagnosis	**45**	**56.96**
Three months after tumor diagnosis	21	26.58
Six months after tumor diagnosis	5	6,32
One year after tumor diagnosis	3	3,79
Total	79	100

In our study, 56.96% of patients had renal failure at the time of diagnosis of the primary tumor.

Clinical manifestations:

Table 6: Distribution of patients according to clinical impact

Clinical manifestation	Number	Perrcentage %
Alteration of general condition and pain	**40**	**50.6**
Fever	26	32,9
Vomiting	6	7.6

Asthenia	5	6.32
Anorexia	2	2.5
Total	79	100

Deterioration in general condition combined with pain were the most common clinical signs, at 50.6%.

Additional tests

Serum creatinine at diagnosis of the disease:

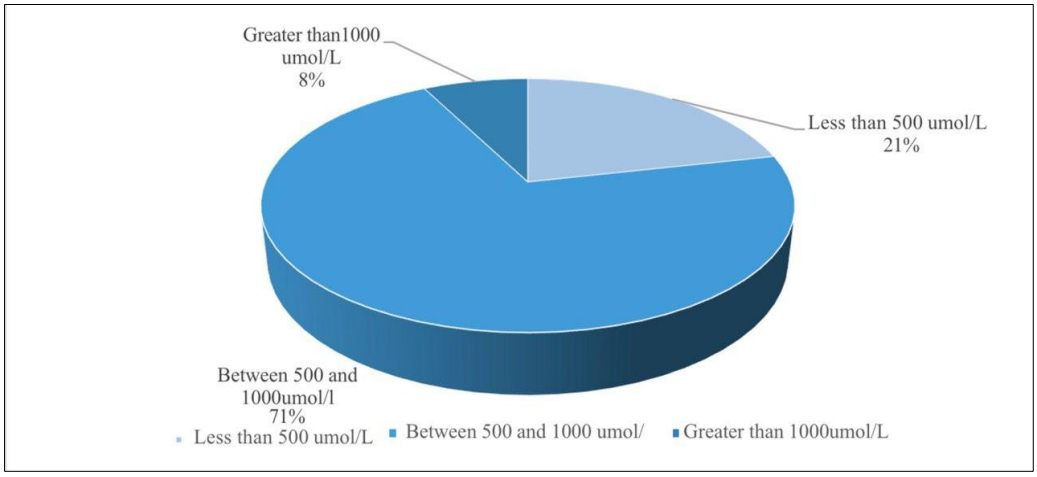

Figure 5: Distribution of patients according to serum creatinine at diagnosis of the disease

71% of patients had a serum creatinine level between [500-1000 µmol/L] at diagnosis of renal failure.

Laboratory assessment:

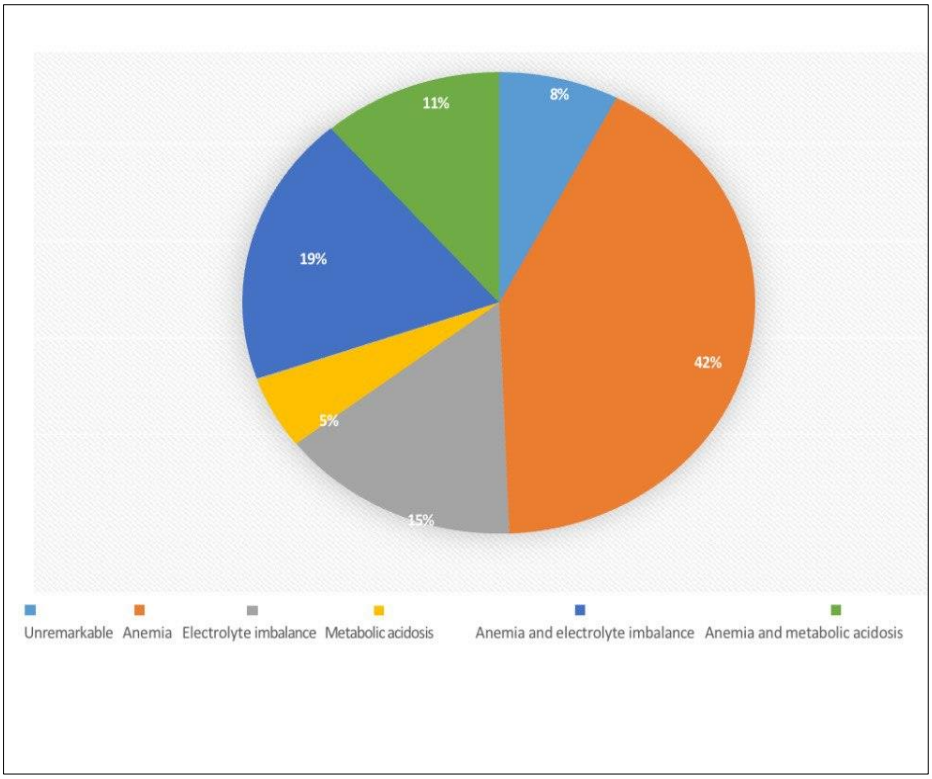

Figure 6: Distribution of patients according to their impact on laboratory tests

Anemia was observed in 42% of patients during our study.

Urinary sediment:

Table 7: Distribution of patients by urinary tract infection

Urine culture	Number	Pourcentage
Negatif	**36**	**45.6**
Presence of leukocystes	8	10.1
Presence of germs	35	44,3
Total	79	100

UCB was negative in 45.6% of patients.

Elevated creatinine and primary tumor:

Table 8: Distribution of patients according to elevated serum creatinine and primary tumor

		Less than 500µmol/L	Between 500 at 1000µmol/L	Greater than 1000µmol/L	Total
Primary Tumor	**Cervical cancer**	**3**	**19**	**4**	**26**
	Colorectal cancer	12	7	1	20
	Bladder cancer	1	15	1	17
	Prostate adenocarcinoma	1	11	0	12
	Cancer de l'ovaire	0	3	0	3
	Carcinose Péritonéale	0	1	0	1
Total		17	56	6	79

Cervical neoplasms had the highest number of elevated serum creatinine levels among the cancers studied.

Medical imaging

Table 9: Distribution of patients according to medical imaging

Medical imaging	Number	Percentage %
Thoraco abdomino pelvic CT scan	**79**	**100**
Abdomino pelvic ultrasound	56	70,88
Cystoscopy	10	12,65
Rectoscopy	7	8,86
Plain abdominal x ray(without preparation)	5	6,32

In our study, all patients had undergone a TAP CT scan.

Therapeutic aspects

Surgery:

Table 10: Patient Distribution by Surgical Decision

Surgical decision	Number	Percentage%
Operated	**47**	**59,50**
Inoperable	32	40.50
Total	79	100

In our sample, surgery was performed on 59.50% of patients.

Surgical Techniques:

Table 11: Distribution by surgical procedure performed

Surgical procedure	Number	Percentage
Percutaneous nephrostomy	**22**	**27.8**
JJ stent placement	10	12.6
Total hysterectomy	8	10.1
Hysterectomy with JJ stent placement	7	8.9
Rectorative sigmoidectomy	5	6.3
Anterior pelvic exenteration	2	2,5
Surgical castration	2	2.5
None	23	29,1
Total	79	100

Percutaneous nephrostomy was performed in 27.8% of patients in our study.

Post-surgery obstruction removal:

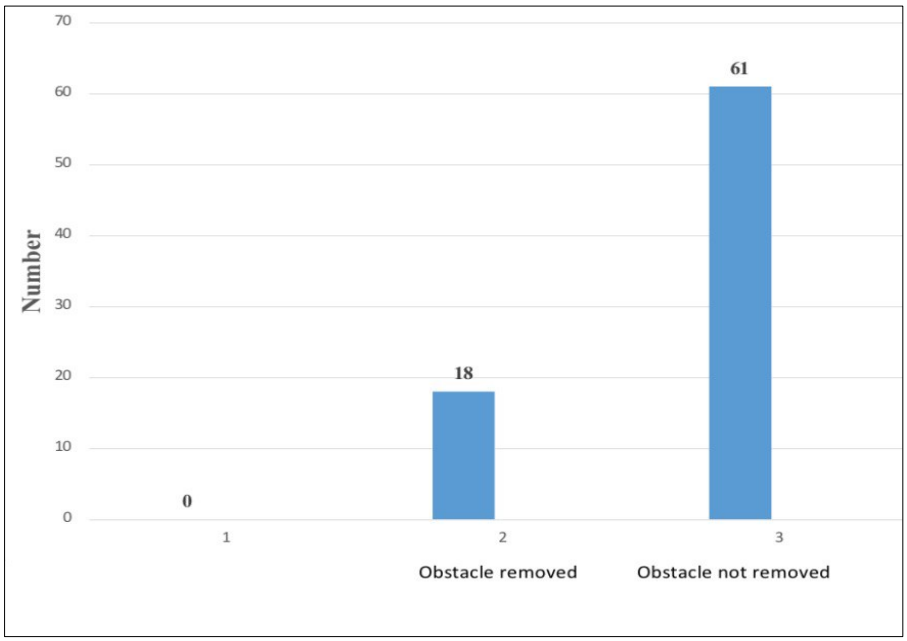

Figure 7: Distribution of patients according to the resolution of the obstacle after surgery

In our series, the obstacle was resolved in 22.8% of patients who underwent surgery.

Hormone therapy:

Table 12: Distribution of patients by hormone therapy

Hormone therapy	Number	Percentage
Yes	4	5,1
No	**75**	**94,9**
Total	79	100

Only 5.1% of our sample had received hormone therapy.

Radiotherapy

Table 13: Distribution of patients by radiotherapy

Radiotherapy	Number	Percentage %
Performed	3	3.8
Not performed	76	96.2
Total	79	100

Radiotherapy was performed on 3.8% of our sample

Chemotherapy:

Table 14: Distribution of patients by chemotherapy

Chemotherapy	Number	Percentage
Not performed	25	31.6
1 to 5 cycles	**29**	**36.7**
6 to 10 cycles	15	18.98
More than 10 cycles	10	12.64
Total	79	100

One to five courses of chemotherapy had the highest percentage, at 36.7%.

Dialysis:

Table 15: Distribution of patients by number of hemodialysis sessions performed

Number of dialysis session	Number	Percentage
0	26	33
1 to 3 sessions	**34**	**43,0**
3 to 5 sessions	17	21,5
More than 5 sessions	2	2,5
Total	79	100

67% of patients had undergone hemodialysis, of which 43.0% had received 1 to 3 dialysis sessions

Indication for dialysis:

Table 16: Distribution of patients according to dialysis indications

Indication for dialysis	Number	Percentage %
Pulmonary Edema (PE)	**12**	**22.64**
Hyperkaliemia	10	18.86
Various indications	10	18.86
Anuria	9	16.98
Metabolic acidosis	7	13.20
Uremic encephalopathy	5	9.43
Total	53	100

OAP and hyperkalemia were the leading causes of dialysis (hemodialysis) indications in our series, at 22.64% and 18.86%. Miscellaneous indications included indications for a CT scan with contrast or general anesthesia due to very high serum creatinine.

Evolution in dialysis:

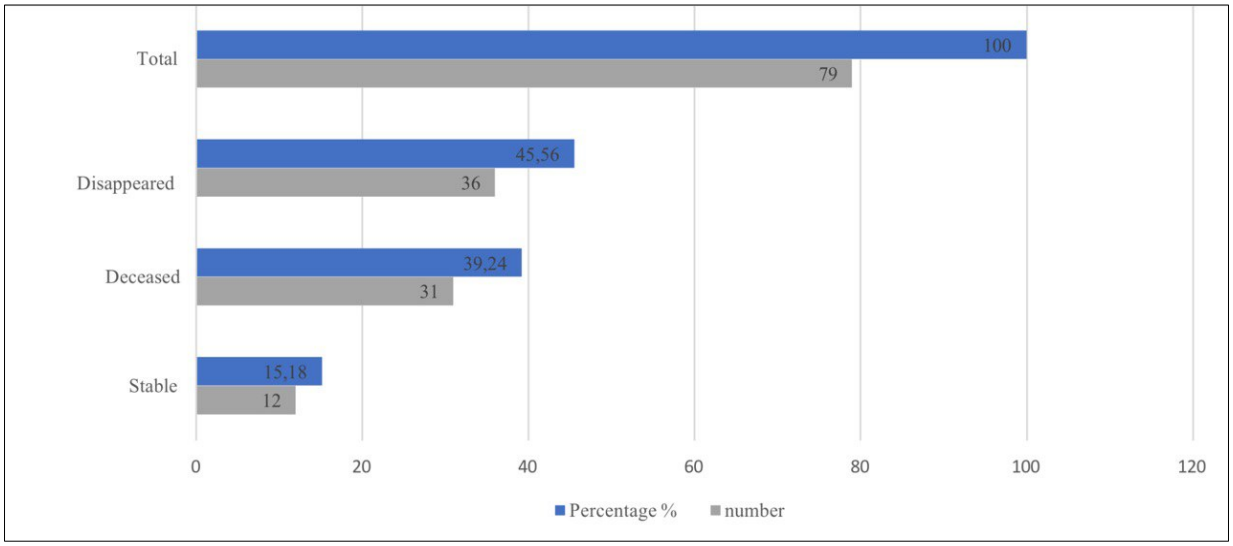

Figure 8: Distribution of cancer patients according to their progress on hemodialysis

Only 15.18% of patients had a stable progress on hemodialysis.

Dependence of chemotherapy on dialysis:

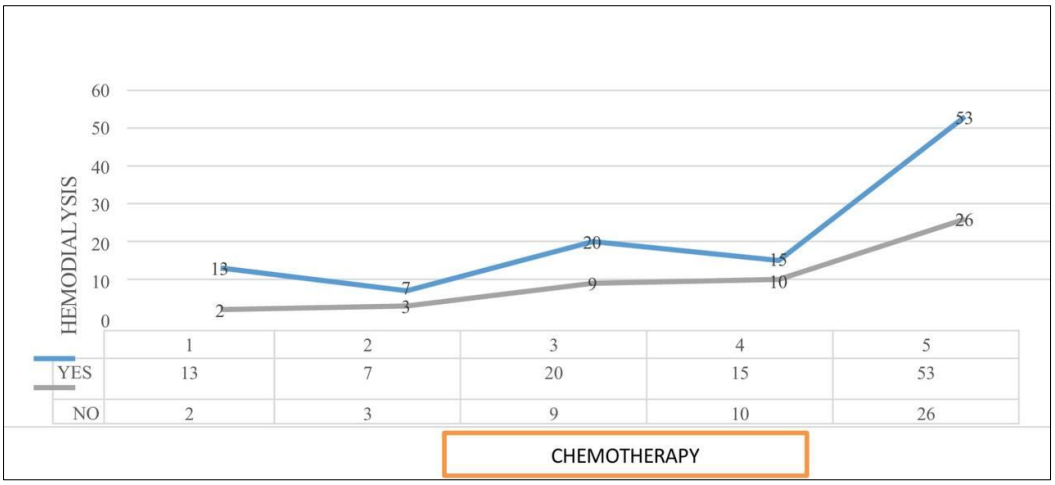

Figure 9: Distribution of patients according to whether chemotherapy required hemodialysis

Iterative hemodialysis allowed chemotherapy to be maintained in some of our patients.

Renal prognosis during treatment:

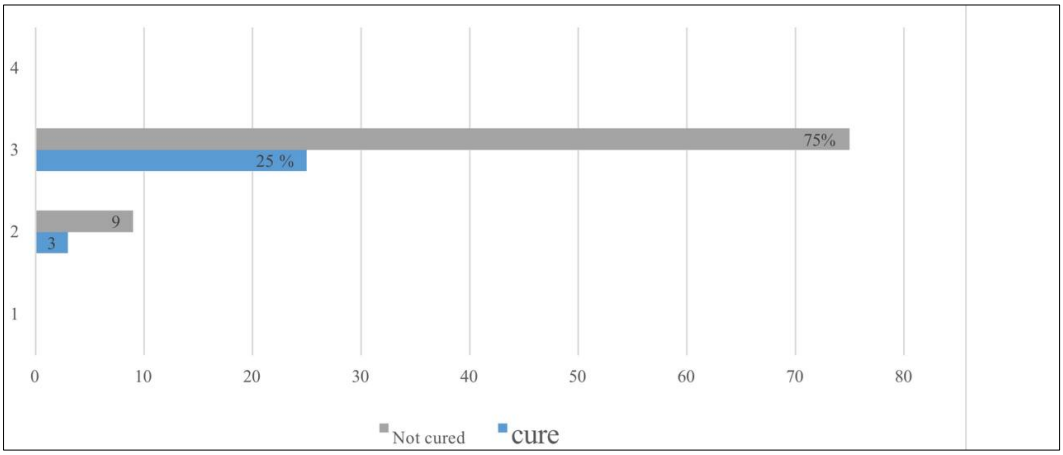

Figure 10: Distribution by renal prognosis during treatment

- The cure rate was 25% in patients who were stable on hemodialysis.
- 75% progressed to CRF and were on chronic hemodialysis.

DISCUSSION

- **Frequency:** During the study period, we collected 240 cases of renal failure due to cancer in the Nephrology Department of the Luxembourg University Hospital, including 79 cases of acute obstructive renal failure, representing a frequency of 32.91%. This frequency is similar to that of Dembélé S, who found 32.39% [5] in the G-spot Nephrology Department. It is higher than that of Diarra M [6] and OUKILI Rachida and BELYAGOUBI Asmaa [7], who found a frequency of 16.06% and 26%, respectively, in the Urology Department of the Pr Bocar Sidy SALL University Hospital in Kati and in Algeria.
- **Sex:** Women outnumbered men, with a percentage of 54% and 46%, respectively; the sex ratio is 0.83 in favor of women.
- **Age**: The average age of our patients was 56.37 years, with a range from 19 to 82 years. Our average age is similar to that of Ms. ES-Salmy ASSIA [8], a study conducted in Morocco that found an average age of 56 years. However, it is higher than the average age of DEMBELE S [5] at Point G, who found an average age of 44.25 years in his series, and lower than the average age of DIARRA M [6], or 62.10 years at the PBSS University Hospital in Kati. This difference is explained by the fact that cancer can occur at any age.
- **Ethnicity:** The Bambara ethnic group was the most represented, with 31.64%. This percentage is slightly lower than that of DIARRA M [6], conducted in Kati, or 35.5%.
- **Primary Tumor and Renal Failure:** In our series, cervical cancer was found in 32.9% of patients, and 89.87% of tumors were diagnosed within one year. These percentages are higher than those of Rachida Oukili and Asmaa Belyagoubi [7], who found 26% and 25%. This difference is explained by late diagnosis and the limited number of treatment

centers, geographic location, and insufficient trained personnel.

- **Reason for Consultation**: In our series, elevated serum creatinine was found in 73.4%, followed by anuria in 13.9%. This result is higher than those of Ms. ES-Salmy Assia [8] and S. Dembele [5], who found percentages of 36% and 56.5%, respectively. This difference is explained by the number of cases, the nature, and the location of the tumors studied.
- **Medical history**: In our series, 69.6% of patients had no known medical history, followed by hypertension in 26.5%. Our percentage is significantly higher than that of OUKILI Rachida and BELYAGOUBI Asmaa [7], who found 38% and 32% for hypertension. The presence of hypertension during obstructive renal failure is linked to renal vasomotion. Renal vasomotion depends on the juxtaglomerular apparatus in relation to the renin-angiotensin-aldosterone system.
- **Clinical implications:** The symptoms of obstructive nephropathy are diverse; they can simultaneously include signs related to uremia (asthenia, vomiting, nausea, weight loss, anorexia) and signs related to the obstructive etiology, either through urination disorders, a change in general condition, or a pain syndrome.
  - Alteration of general condition and pain: the long-term complication of cancer and the clinical manifestation of obstruction account for 50.6%. This percentage is lower than that of DEMBELE S [5] and Ms ES Salmy ASSIA [20] who respectively found 65.20% and 100% pain in their series.
  - Fever: a sign of infection, was found in 32.9% of our series. This percentage is lower than that of DEMBELE S [5] who found 65.20% in his series. This difference can be explained by the fact that fever reinforces the hypothesis of urinary infection during obstructive pathologies; but with reservations related to other extra-urinary pathologies that can accompany the obstruction.
  - Anorexia, asthenia and vomiting: signs of uremia or clinical manifestation of anemia, were in 16.4% of our series compared to 73.90% in DEMBELE S [5].
- **Biological repercussions**: Anemia was present in 42% in our series, a percentage slightly lower than that of Mrs. Es Salmy Assia [8] who found a percentage of 61%, this is explained by the fact that anemia can be due either to the development of tumor processes or to an impact of the obstruction on the renal parenchyma. Ionic disorders, in our series were present in 15% of patients against 6% in the series of OUKILI Rachida and BELYAGOUBI Asmaa [7], hyperkalemia remains the major risk in this situation of obstruction often requiring even an ECG to identify cardiac damage. Metabolic acidosis was present in 5% of cases. Urinary tract infection was found in 45.6% in our series compared to 24% in the series of Mrs. Es Salmy Assia [8], and 32.3% [6] in the series of DIARRA M. The presence of fever on one side and isolated germs on the other side, confirm the frequency of this fever during obstructions and especially of tumor origin. At the time of diagnosis, 71% of patients in our series had a creatinine level between 500 and 1000 µmol/l, 8% higher than 1000µmol/l and 21% a creatinine level lower than 500µmol/l. This is explained by the delay in diagnosis, the degree of involvement and the area of location of the tumor.
- **Imaging:** Imaging was an important tool in confirmation, etiological investigation, lesion localization, and potential complications related to obstruction and cancer. The most common abnormalities found were pyelocaliceal dilations, laminated parenchyma, and ureterohydronephrosis. In our series, 100% of patients underwent a TAP CT scan compared to 50.6% in the series by DIARRA M. This difference is explained by the fact that CT was a decisive element in the therapeutic decision-making process for tumor processes.
- **Therapeutic Aspects:** In cases of acute obstructive renal failure, the most sought-after therapeutic option was surgery to remove the obstruction whenever possible or to minimize complications in advanced tumors. In the management of pelvic tumors of tumor origin, therapeutic options depend on the period of diagnosis, the extent of the lesions, the general condition of the patients and the availability of the treatment technique. In our series, 59.49% benefited from surgery (surgical castration 2.8%; anterior pelvectomy 2.8%; rectosigmoidectomy 6.3%; hysterectomy and JJ rise 8.8%; total hysterectomy 10.1%; JJ rise 12.6% and nephrostomy 27.4%) against 40.51% inoperable. This percentage of surgery is higher than that of OUKILI Rachida and BELYAGOUBI Asmaa [7] and DIARRA M [6] who had 22% and 42.5% respectively.
- **Hormone therapy and radiotherapy**: In our series, were performed in 5.1% and 3.8% of our patients respectively. A percentage of radiotherapy lower than that of OUKILI Rachida and BELYAGOUBI Asmaa [7] and Patricia Awa LEDJI KOUEKE [9] who had 11% and 77.1% respectively. This difference is explained by diagnostic delays and insufficient technical facilities. Chemotherapy based mainly on palliative care was performed in 68.32% of patients in our series. Patricia Awa LEDJI KOUEKE [9] and OUKILI Rachida and BELYAGOUBI Asmaa [7] had in their series (respectively) 33% and 39%.

Hemodialysis was performed in 64.6% of patients in our series. This percentage is lower than that of H. Bourouhou *et al.,* [10] who had 82% in their series. Indications posed to confirm either the obstruction or the extent of the lesion or a replacement treatment in palliative chemotherapy situations. Hemodialysis was

indicated in emergency situations such as acute pulmonary edema (22.64%), hyperkalemia with or without electrical manifestation (18.86%), uremia (9.43%), profound metabolic acidosis (13.20%) and anuria (16.98%).

The prognosis of acute renal failure when it requires extrarenal purification is poor, with a hospital mortality ranging from 77 to 84% [11]. It has already been shown that the prognosis of the oncohematology patient depends largely on the number of organ failures at admission [12]. Furthermore, renal failure can lead to changes in the treatment regimen (reduction of chemotherapy doses, contraindications to certain treatments), and these changes can compromise patients' treatment plans.

In our study, 67.08% of patients receiving chemotherapy had undergone dialysis (Extra renal purification), with a mortality rate of 39.24%; 45.56% of patients were lost to follow-up during treatment. The renal prognosis was good in 25% of patients stable on hemodialysis, and 75% progressed to end-stage renal disease.

CONCLUSION

Cancer is becoming a global scourge, with 15 million new cases diagnosed in 2015 and nearly 9 million deaths, according to the most recent epidemiological data. This scourge increasingly affects populations in low- and middle-income countries, where poverty, inadequate health systems and professional training, weak health education, and social and cultural prejudices are prevalent. Cancer is a public health problem in French-speaking Africa, although its incidence and mortality are currently underestimated. Its diagnosis is often delayed, limiting treatment options. Improved collaboration is needed in the areas of treatment and research.

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