Scientific Research Publishing

Journal of Cancer Therapy, 2025, 16(12), 472-488
https://www.scirp.org/journal/jct
ISSN Online: 2151-1942
ISSN Print: 2151-1934

Insights from the Muk and Maseb Radiotherapy Centre in Kinshasa: A Study of 43 Cases of Rectal Cancer

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How to cite this paper: Dao, A., Elame, E.F., Yessoufou, M., Coulibaly, I., Ka, K., Nakundi, V., Mapenya Mekah, R.R., Maison Mayeh, A.-M., Mopoh, G., Minoungou, N.A.A., Mukeng, F., Apithy, M.-S., Batalansi, B.D. and Sulu Maseb A Mwang, S. (2025) Insights from the Muk and Maseb Radiotherapy Centre in Kinshasa: A Study of 43 Cases of Rectal Cancer. *Journal of Cancer Therapy*, **16**, 472-488.
https://doi.org/10.4236/jct.2025.1612036

Received: November 3, 2025
Accepted: December 19, 2025
Published: December 22, 2025

Abstract

Background: Colorectal cancer (CRC) ranks as the third most prevalent cancer and is the second leading cause of cancer-related deaths globally. Despite global advancements, sub-Saharan Africa, particularly the Democratic Republic of Congo, faces considerable challenges in implementing effective treatment protocols, negatively impacting patient outcomes. This study analyzes 43 rectal cancer patients treated at the Muk and Maseb Radiotherapy Centre within the Centre Hospitalier Nganda in Kinshasa. **Methodology:** We conducted a cohort study with a retrospective data collection approach. The study encompassed all rectal cancer patients treated from January 1, 2020, to December 2024, with follow-up until October 2025. Data were collected between July 2025 and October 30, 2025, and analyzed using SPSS 2021. **Results:** The average age of patients was 51.67 years, with ages ranging from 22 to 74. The male-to-female ratio was 0.72 (18/25). Performance status was predominantly 0 (44.2%), followed by 1 (41.9%). Tumors were classified as T3 (48.8%) or T4 (51.2%), with lymph node involvement in 76.7% of cases. Curative intent radiotherapy was planned for 86% of patients, with the PRODIGE 23 protocol being the most commonly implemented. The main chemotherapy regimens were FOLFOX 4 (20.93%) and XELOX (18.60%). The delay from diagnosis to radiotherapy consultation averaged 134 days, significantly affecting management. The mean overall survival was 24.30 months (95% CI 19 - 30), with a 3-

year survival rate of 20.9%. **Conclusion:** In summary, timely and high-quality care is crucial for improving survival rates in rectal cancer patients in the Democratic Republic of Congo. Addressing delays in treatment and implementing standardized protocols can significantly enhance patient outcomes and overall prognosis.

Keywords

Rectal, Cancer, Radiotherapy, Outcomes, Kinshasa

1. Introduction

Colorectal cancer (CRC) ranks as the third most prevalent cancer and is the second leading cause of cancer-related deaths globally [1] [2]. In the United States alone, nearly 150,000 new cases and over 50,000 deaths from CRC are reported annually [2]. Alarmingly, the incidence of rectal cancer is projected to surge by 124.2% among adults aged 20 - 34 years by 2030. This alarming trend has prompted a focus on optimizing treatment approaches [3].

Africa, the second largest and most populous continent, had an estimated population of 1.3 billion in 2018, accounting for 16% of the world's population. Despite this large demographic, the characterization of colorectal cancer in Africa remains inadequate, largely due to insufficient data on incidence, prevalence, and mortality rates across the continent. Most available statistics derive from limited cancer registries that cover less than half of the population [1] [3]-[5]. Notably, over 90% of colorectal cancer cases occur in individuals aged 50 and older. A 2016 study in Morocco indicated a slight male predominance, with a sex ratio of 1.17 [6].

Sub-Saharan Africa is grappling with high burdens of communicable diseases while simultaneously witnessing rising incidences and mortalities from non-communicable diseases, including cancer. This increase is linked to inadequate control of cancer-related infections and unhealthy lifestyle choices, which can be mitigated through effective public health interventions. Mortality from cancer is closely tied to the stage at diagnosis [1] [7] [8].

Despite advancements in treatment, including surgery, chemotherapy, and radiotherapy, the management of CRC often remains suboptimal, particularly in resource-limited settings such as sub-Saharan Africa and the Democratic Republic of Congo. Current gold-standard treatments for rectal cancer involve a multidisciplinary approach that includes total neoadjuvant treatment (TNT) followed by surgical resection and adjuvant therapy to enhance survival outcomes [3].

Research on colorectal cancer in the Democratic Republic of Congo (DRC) is limited, similar to findings in Cameroon, Nigeria, and Tanzania [9]-[12]. However, management of rectal cancer has improved significantly over recent decades, leading to better oncological outcomes. Historically, inadequate locoregional con-

trol was a major cause of morbidity and mortality for patients undergoing surgery alone [3]. Multimodal treatment strategies, such as Total Neoadjuvant Therapy (TNT), aim to enhance both systemic and local control. The RAPIDO study demonstrated comparable local recurrence rates between TNT and chemoradiotherapy after three years [3] [13] [14]. Understanding the underlying mechanisms of these therapies is crucial; for instance, chemotherapy works by targeting rapidly dividing cancer cells [3], while radiotherapy employs ionizing radiation to induce DNA damage in tumor cells, leading to cell death or impaired replication [14]. Effective prevention strategies, notably fecal occult blood testing (FOBT), play a vital role in early detection, significantly correlating with a reduced incidence and mortality from CRC when implemented through well-designed public health campaigns |8]. A meta-analysis showed that screening with gFOBT reduces CRC mortality [8]. These campaigns not only foster greater awareness but also encourage regular screening, which can lead to earlier interventions and improved outcomes [3].

An evaluation conducted by Ngo Nonga *et al.* in Cameroon between 2004 and 2007 reported a one-year survival rate of 85%, a two-year survival rate of 60%, and a four-year survival rate of 42% in patients with locally invasive rectal cancer [9].

Given the scarcity of recent data regarding prognostic factors, management strategies, and survival outcomes for rectal cancer patients in the DRC, this study of 43 patients is essential for enhancing our understanding and improving patient evaluation and management in this context.

This study aims to analyze the treatment and outcomes of patients with rectal cancer at the Muk and Maseb Radiotherapy Centre, contributing valuable insights into the current challenges and effectiveness of treatment protocols in our region.

2. Methodology

2.1. Study Design

This study is a retrospective cohort analysis conducted at the Muk and Maseb Radiotherapy Centre. We conducted a cohort study with retrospective data collection at the Muk and Maseb Radiotherapy Centre in Kinshasa, Democratic Republic of Congo. Data collection occurred from September 15 to October 30, 2025. Prior to the study, we obtained ethical approval from the relevant ethics committee, and informed consent was secured from each patient through a standardized consent form.

2.2. Inclusion and Exclusion Criteria

- Inclusion criteria for participant selection included a histologically confirmed diagnosis of rectal cancer, age 18 years and older and patients who underwent either surgery or received neoadjuvant treatment. Thus, we included all patients (n = 43) who received treatment for rectal cancer at the Muk and Maseb Radiotherapy Centre between January 1, 2020, and December 31, 2024. Clini-

cal and paraclinical data were extracted from patients' electronic medical records. For those patients still alive whose last follow-up occurred more than three months prior to data collection, we conducted follow-up calls to ascertain their current health status.

- Exclusion criteria were patients with incomplete medical records. For the current study, we didn't exclude any patients.

2.3. Statistical Methods

Quantitative variables were summarized using mean, standard deviation, minimum, and maximum values. For variables with a standard deviation exceeding the mean, we reported the median along with the first and third quartiles. Qualitative variables were expressed as frequencies and percentages. Data analysis was carried out using SPSS 2021. Descriptive statistics were computed for demographic data. Survival analyses were performed using Kaplan-Meier estimates, and differences in survival rates were evaluated with the log-rank test. A p-value of <0.05 was considered statistically significant.

2.4. TNM Staging Classification

Tumor staging was determined according to the American Joint Committee on Cancer (AJCC) 8th Edition staging criteria. The classifications utilized were as follows: T1 (Tumor invades the submucosa), T2 (Tumor invades the muscularis propria), T3 (Tumor invades through the muscularis propria into the perirectal tissues) and T4 (Tumor invades other organs or structures). Regarding the nodal involvement, the tumor was classified N0 (No regional lymph node metastasis), N1 (Metastasis in 1 - 3 regional lymph nodes), N2 (Metastasis in 4 or more regional lymph nodes). Distant metastasis was categorized as M0 (No distant metastasis) and M1(Distant metastasis present). We also use the stadification stage I (T1T2N0M0), stage II (T3T4N0M0), stage III (Any T, N1N2M0) and stage IV (any T, any N, M1).

2.5. Radiotherapy Techniques: IMRT and VMAT

In this study, we utilized two advanced radiotherapy techniques: Intensity-Modulated Radiation Therapy (IMRT) and Volumetric Modulated Arc Therapy (VMAT). Both techniques are notable for their ability to deliver precise radiation doses to the target tumor while minimizing exposure to surrounding healthy tissues.

- IMRT allows for the customization of radiation beams to the shape of the tumor, improving the therapeutic ratio by delivering higher doses to the tumor and reducing damage to adjacent critical structures. This is especially beneficial in treating rectal cancer, where proximity to vital organs can complicate treatment delivery.
- VMAT further enhances the advantages of IMRT by allowing for continuous variation of the radiation beam's intensity and angle during treatment. This results in a more efficient treatment delivery, potentially reducing overall treat-

ment time while maintaining high conformity to the tumor shape.

The choice of IMRT and VMAT in our study reflects our commitment to employing state-of-the-art techniques aimed at optimizing treatment outcomes for patients with rectal cancer. These modalities were selected for their proven efficacy in improving local control rates while minimizing acute and long-term side effects.

2.6. Treatment Description

- PRODIGE 23 Trial: The PRODIGE 23 trial is a multicenter, randomized study designed to evaluate the efficacy of a total neoadjuvant therapy (TNT) approach in patients with locally advanced rectal cancer. In this trial, patients received 6 cycles of FOLFOX (oxaliplatin and fluorouracil) chemotherapy followed by chemoradiotherapy. The radiotherapy protocol consisted of a total dose of 50.4 Gy delivered using Intensity-Modulated Radiation Therapy (IMRT) or Volumetric Modulated Arc Therapy (VMAT) in daily fractions over a period of 5 weeks. Patient received also concurrent chemotherapy based on capecitabine 825 mg/m^2 BID and then surgery 2 - 4 weeks after chemotherapy. We implemented this protocol in our study.
- RAPIDO Trial: The RAPIDO trial focuses on the effectiveness of a short-course radiotherapy regimen combined with chemotherapy as part of the neoadjuvant treatment for rectal cancer. Participants underwent a 5-day course of radiotherapy delivering 25 Gy in 5 fractions, a technique that can be achieved via 3D conformal radiotherapy (3D-CRT) or IMRT, followed by 6 cycles of FOLFOX chemotherapy and then surgery 2 - 4 weeks after chemotherapy. We implemented this protocol in our study.
- Long course radiotherapy was implemented for patients treated in 2020 and 2021. The radiotherapy dose and fraction are the same as in Prodige 23. Patients received capecitabine 825 mg/m^2 during radiotherapy and then surgery 4 - 6 weeks after chemotherapy.
- For palliative radiotherapy, we gave 30 Gy in 10 fractions using IMRT technique.

3. Results

3.1. Socio-Demographic Characteristics

In our cohort of 43 patients, the average age was 51.67 years, with ages ranging from 22 to 74 years and a standard deviation of 14.39. The median age was 54 years.

The histogram below (**Figure 1**) illustrates the age distribution of patients (N = 43) treated for rectal cancer in our cohort. The x-axis represents the age of patients, while the y-axis shows the frequency of patients within specific age ranges. The figure visualizes the age demographics of rectal cancer patients, emphasizing that middle-aged individuals are most frequently affected.

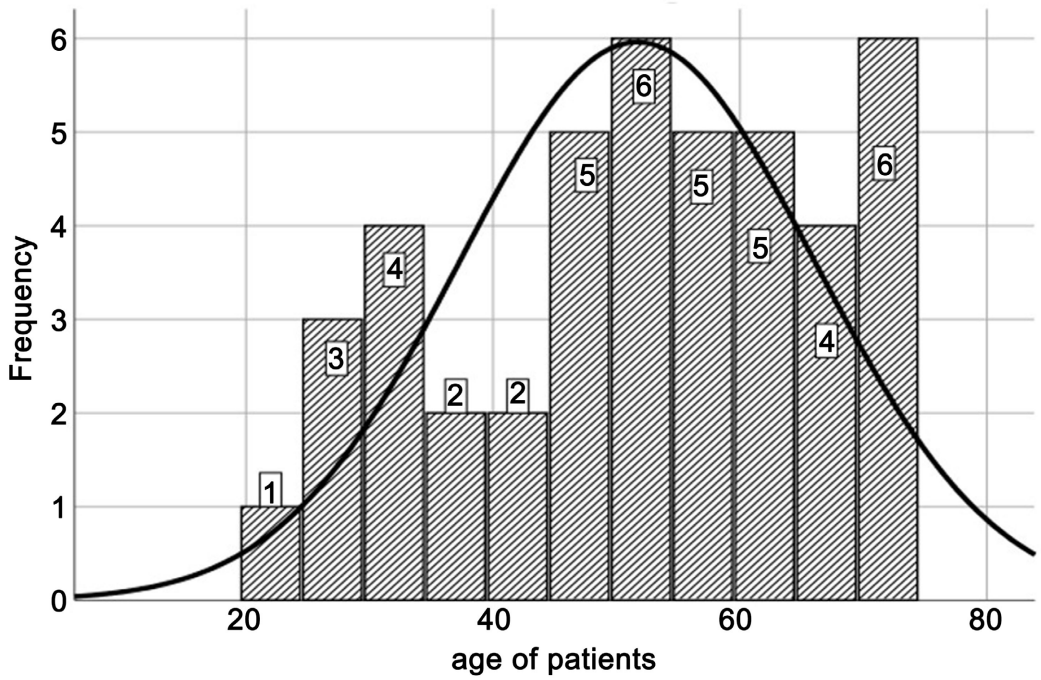

Figure 1. Distribution of the patients regarding the age, with a Gaussian curve.

Regarding the other sociodemographic characteristics:

- Age: A majority of the patients (60.5%) are aged 50 years or older, indicating that rectal cancer predominantly affects older individuals in this cohort. Conversely, 39.5% of patients are under 50 years of age.
- Gender: The gender distribution shows that 58.1% of the patients are female, while 41.9% are male. The sex ratio, male to female, is 0.72.
- Marital Status: Most patients are married (72.1%), followed by single patients (18.6%) and widows (9.3%).

3.2. Clinical and Therapeutic Characteristics

The clinical characteristics and the therapeutic characteristics of the patients are summarized in Table 1 below.

Table 1. Distribution of patients based on clinical characteristics.

Category		Number	Percentage
Performance status (PS)	PS/WHO = 0	19	44.2
Of World Health Organization (PS/WHO)	PS/WHO = 1	18	41.9
	PS/WHO = 2	6	14.0
Histology Type	Adenocarcinoma grade 1	22	51.2
	Adenocarcinoma grade 2	21	48.8
Tumor (T) staging	T3	21	48.8
	T4	22	51.2

Continued

Nodes (N) staging	N0	10	23.3
	N1	23	53.4
	N2	10	23.3
Metastases (M) staging	M0	38	88.4
	M1	5	11.6
Staging	II	10	23.3
	III	27	62.8
	IV	6	14.0
Treatment intent	Curative	37	86.0
	Palliative	6	14.0
Treatment Strategy	Long course	7	16.3
	PRODIGE 23 Protocol	20	46.5
	Rapido Protocol	9	20.9
	post-operative EBRT	5	11.6
	Palliative EBRT	6	4.7

EBRT: External Beam Radiation Therapy.

The chemotherapy protocols are illustrated in Figure 2 below.

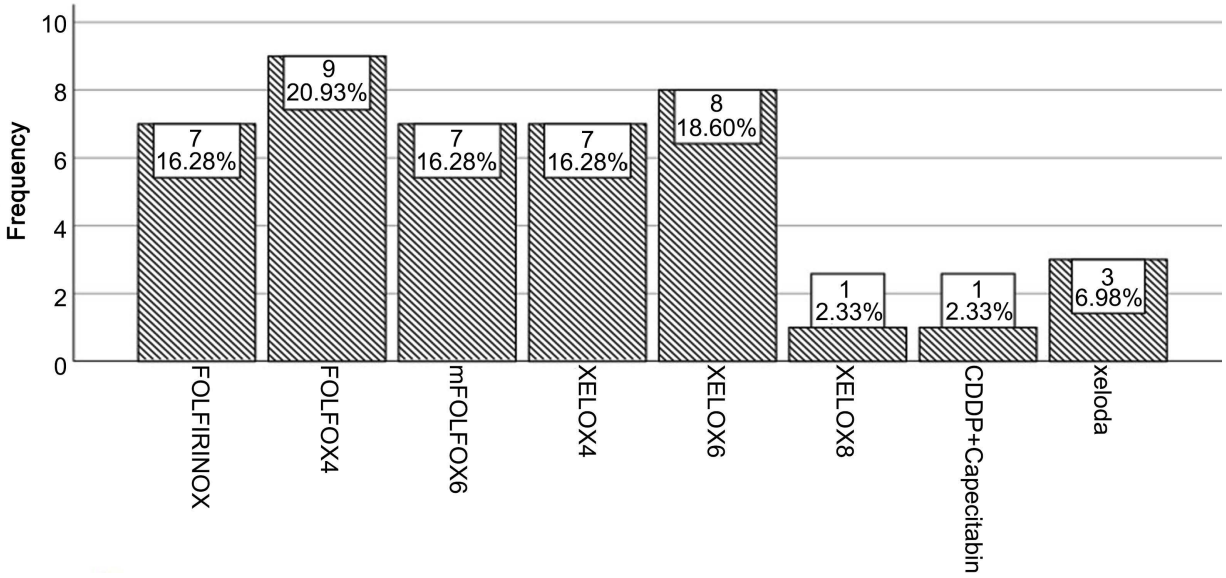

Figure 2. Distribution of the patients regarding the chemotherapy regimen administered.

3.3. Chemotherapy and Radiotherapy Side Effects

Table 2 below summarizes the side effects associated with radiotherapy and chemotherapy.

Table 2. Distribution of patients based on the side effects of chemotherapy and/or radiotherapy.

Category		Number	Percentage
Anemia	G0	21	48.8
	G1	11	25.6
	G2	8	18.6
	G3	3	7.0
Thrombocytopenia	G0	34	79.1
	G1	9	20.9
Nausea	G0	18	41.9
	G1	9	20.9
	G2	16	37.2
Vomiting	G0	24	55.8
	G1	8	18.6
	G2	9	20.9
	G3	2	4.7
Rectal mucositis	G0	9	20.9
	G1	9	20.9
	G2	25	58.2
Radiodermatitis	G0	16	37.2
	G1	8	18.6
	G2	16	37.2
	G3	3	7.0

G = Grade.

3.4. Surgical Outcomes

In our cohort, 26 patients underwent surgery. Of these, 4 patients had the procedure prior to radiotherapy, while 22 patients were operated on after completing radiotherapy. Among the 22 patients who underwent surgery post-radiotherapy, 5 experienced either per- or postoperative complications, accounting for approximately 22% of this subgroup. We were unable to collect enough data to classify postoperative complications using the Clavien-Dindo classification system. However, feedback from the surgical team indicated that 2 patients died from systemic infections, while an additional 3 patients experienced fatal outcomes during surgery due to hemorrhages and hemostatic issues.

Among the 17 patients who did not have surgery, 5 were found to have distant metastases, and 1 had a tumor invading surrounding organs, which was deemed inoperable. Additionally, 11 patients, accounting for 25.6% of the total cohort, declined surgical intervention. Most of these patients experienced significant tumor regression; however, they would have needed an abdominoperineal resection

due to sphincter invasion. We acknowledge that the reasons for their refusal were not comprehensively documented.

3.5. Delays and Duration of the Treatment

The treatment timelines are summarized as follows in Table 3 below:

Table 3. Characterization of treatment timelines, dose, number of chemotherapy cycles, and participation time.

	Delay 1* (days)	Delay 2** (days)	Delay 3*** (days)	Dose of radiation (Grays)	Chemotherapy cycle number	EBRT Timeline
Mean	134.60	12.70	31.33	42.84	5.09	20.98
Median	86.00	9.00	36.00	50.00	6.00	17.00
Mode	30[a]	5[a]	5	50	6	25
Standard deviation	154.836	10.098	20.364	12.140	0.971	13.275
Minimum	21	1	5	25	4	2
Maximum	743	41	82	70	6	68
25th Percentile	42.00	5.00	8.00	25.00	4.00	11.00
50th Percentile	86.00	9.00	36.00	50.00	6.00	17.00
75th Percentile	163.00	18.00	48.00	50.00	6.00	28.00

*Delay 1: Delay between diagnosis (date provided by the pathology report) and simulation; **Delay 2: Delay between simulation and treatment starting; ***Delay 3: Delay between the first fraction and last fraction of EBRT.

3.6. Clinical Outcomes

In this study, the survival variable represents the time participants spent in the study, while the event of interest is defined as death. Out of 43 patients, 34 are deceased, and 9 patients are censored. Our overall survival rate over three years is 20.9%. The 25-month survival rate is 37.5%, and 42-month survival rate is 5.3%. The mean survival duration is 24.3 months (95% CI: 18.5 - 29.9), and the median survival time is 18 months (IC 95%: 11.2 to 24.8 months). Subgroup analyses were conducted based on sex, marital status, age (under 50 vs. 50 and older), intent treatment with radiotherapy, performance status, T, N, and M staging. Results of these analyses are detailed in Table 4 below.

Table 4. Subgroup survival analysis: key metrics and statistical tests.

Subgroups	Variables	Median survival	Average survival	Chi-square (X^2)	Log-rank test
Gender	Men	32	26.7 (95% CI: 20.4 - 32.9)	2.375	0.123
	Women	16	20.8 (95% CI: 14.3 - 27.4)		
Marital status	Married	28	33.5 (95% CI: 23.0 - 43.9)	4.816	0.028
	Unmarried	16	18.9 (95% CI: 14.8 - 23.1)		
Age	<50 yrs old	25	27.2 (95% CI: 16.5 - 37.8)	0.340	0.560
	≥50 yrs old	17	21.3 (95% CI: 16.1 - 26.5)		

Continued

PS-WHO	PS = 0	15	17.5 (95% CI: 12.7 - 22.3)	2.714	0.099
	PS = 1 or 2	25	27.5 (95% CI: 20.3 - 34.7)		
Staging T	T3	18	24.9 (95% CI: 15.2 - 34.6)	0.000	0.998
	T4	25	23.2 (95% CI: 18.3 - 28.2)		
Staging N	N0	16	18.4 (95% CI: 11.5 - 25.7)	0.537	0.464
	N1N2	25	25.5 (95% CI: 18.9 - 31.9)		
Staging M	M0	18	24.8 (95% CI: 18.4 - 31.2)	0.352	0.553
	M1	25	21.8 (95% CI: 17.1 - 26.5)		
EBRT Intent	Curative	18	24.8 (95% CI: 18.3 - 31.4)	0.340	0.560
	palliative	25	22.3 (95% CI: 18.3 - 26.3)		

EBRT: External Beam Radiation Therapy.

4. Discussion

This series of 43 patients highlights the management of rectal cancer at Muk and Maseb Radiotherapy Centre in Kinshasa. While it may not fully represent the epidemiological, therapeutic, and prognostic aspects of this pathology across the Democratic Republic of Congo or Africa, the findings raise critical questions regarding the improvement of management strategies and survival outcomes for rectal cancer patients.

The analysis shows that the majority of patients are aged between 50 and 60, indicating that rectal cancer primarily affects middle-aged individuals within this cohort. Notably, the highest frequencies are observed in the 50 - 54 and 55 - 59 age groups, each comprising six patients. This significant concentration aligns with existing literature highlighting a higher incidence of colorectal cancer in older populations [15]. These findings are consistent with a similar study conducted in Cameroon by J. P. Engbang *et al.* [9], which reported a median age of 52.84 ± 13.55 years and a balanced sex ratio of 1 (54/54), mirroring our own results. Furthermore, a systematic review by Martinsfi T *et al.* identified several epidemiological similarities across 18 studies from seven sub-Saharan African countries [7], suggesting that shared epidemiological factors may account for these comparable figures [1].

All patients in our study presented with symptoms at their first consultation. The average delay of 134.60 days (approximately 4 months) between diagnosis (date provided by the pathology report) and simulation is more favorable than the 10.91 ± 12.69 months reported by J. P. Engbang *et al.* [9] in Cameroon. This discrepancy may be attributed to differences in how the delay is defined; patients often exhibit symptoms for a long time before coming to the clinic, and there can be significant delays in undergoing biopsies and receiving pathology results. Wang *et al.* (2012) noted that only patients with a family history underwent systematic screening prior to developing symptoms [16]. Therefore, emphasizing systematic and early screening in Africa is essential, especially since Fatima Ez-

zahra Imad *et al.* demonstrated that the incidence of rectal cancer increases with age in a Moroccan cohort published in 2019 [6]. Research indicates that delays in cancer treatment can significantly increase the risk of mortality [16].

The majority of patients present with a PS of 0 (44.2%) or 1 (41.9%), indicating that most are functioning well and able to carry out daily activities [15].

In a similar study by Savom *et al.* in Cameroon, 42% of colorectal cancer patients presented with complications, primarily intestinal obstruction, with the most common performance status being stage 2 (42%) [17]. The recurrence of deteriorating performance status in their findings may be attributed to the frequency of complications, particularly obstructive syndrome, which has been noted by various authors across Africa at diagnosis, albeit usually in smaller proportions [10] [18]. In our study, a smaller proportion (14.0%) has a PS of 2, suggesting some limitation in their daily functions [15]. Performance status is an important prognostic factor in colorectal cancer [19].

Histologically, adenocarcinomas dominated our series, accounting for all cases. This is consistent with literature indicating that over 90% of rectal cancers are adenocarcinomas, thereby confirming the rarity of squamous cell carcinomas in this region [20]. The histological analysis reveals that 51.2% of tumors are classified as adenocarcinoma grade 1, while 48.8% are grade 2. Adenocarcinoma is the most common type of colorectal cancer. The grading of adenocarcinoma is based on the degree of gland formation [21].

In terms of tumor staging, 51.2% of the patients have T4 tumors, while 48.8% have T3 tumors. This suggests a relatively aggressive disease presentation, as T4 indicates a more advanced stage of tumor growth. The TNM staging system is used to classify the extent of the cancer [22].

The nodal involvement shows that 53.4% of patients are classified as N1, indicating the presence of cancer in nearby lymph nodes [23]. In contrast, 23.3% are N0 (no nodal involvement) and another 23.3% are N2. Lymph node metastasis is an important prognostic factor in colorectal cancer [24]. The majority of patients (88.4%) are classified as M0, indicating no distant metastasis, while 11.6% present with M1, suggesting some patients have metastatic disease [25] [26]. This distribution indicates that most patients have localized disease, which may influence treatment options and prognosis [27]. The majority of patients (62.8%) presented with stage III disease, reflecting the predominance of this as reported in the African literature [9] [18]. The lack of systematic screening for colorectal cancer in many African countries likely contributes to the high incidence of stage III diagnoses [8] [11] [16].

In most cases, the treatment goal was curative for 37 patients (86%) indicating a strong focus on eradicating the cancer. For non-metastatic tumors, advancements in understanding microscopic lymphatic tumor extension in the mesorectum and effective MRI assessments facilitated the establishment of criteria for operability and resectability after neoadjuvant therapy [28] [29]. In contrast, 14.0% of patients are undergoing palliative treatment, reflecting the need for symptom management and improved quality of life in advanced cases [30] [31].

The treatment strategies employed vary among patients. The Prodige 23 Protocol is the most commonly utilized strategy, accounting for 46.5% of the cases, suggesting its effectiveness in this patient population [28]. This protocol typically involves neoadjuvant chemotherapy with FOLFIRINOX followed by chemoradiotherapy [28]. The long course treatment strategy is used for 16.3% of patients [32], while the Rapido Protocol is employed in 20.9% of cases [33], indicating a diverse approach to treatment.

In this series, only 20 out of 43 patients (46.5%) received neoadjuvant chemotherapy, with the 4 to 6 cycle XELOX protocol being the most frequently used, administered to 15 patients (34.9%). This predominance of the XELOX (or CAPOX) protocol may align with various recommendations in the literature, which often suggest 6 cycles of CAPOX or 9 cycles of FOLFOX in the neoadjuvant context for colorectal cancers [13] [34]-[36].

Patients treated in 2020 and 2021 received the long-course protocol, which was the standard recommendation until the results of the PRODIGE 23 and RAPIDO trials were published in December 2020. Notably, a significant number of patients underwent surgery prior to being referred for radiotherapy (11.6%). This practice should be discontinued, as rectal surgery without radiotherapy or total neoadjuvant therapy (TNT) has not been considered standard care for many years. In resource-limited settings like the Democratic Republic of Congo, healthcare practitioners may find themselves in situations where surgery is the only option for providing even temporary relief to patients. However, enhancing the availability of radiotherapy and implementing training programs is essential for facilitating a necessary shift in treatment protocols.

The median overall survival in our study population was 18 months, closely matching the 15 months noted by Yeboah *et al.* in Ghana in 2018 [37]. Longer median survival times of 31.9 months, 40 months and 69.5 months were reported respectively by Carlomagno *et al.* in Italy in 2018 [38], Mesli *et al.* in Algeria (2015) [39] and Shan *et al.* in China (2017) [40]. The 1-year overall survival rate in our study was 80%. A lower rate of 57.7% was found by Gbessi *et al.* in Benin in 2014 [41]. A high 1-year survival rate of 92.8% and 97.7% was reported respectively by Arfa *et al.* in Tunisia in 2006 [42] and Shan *et al.* in 2017 [40]. The 3-year overall survival rate in our series was 20.9%, closely matching the 21% reported by Yeboah *et al.* in 2018 [37]. In contrast, Fernandez *et al.* reported a considerably higher 3-year overall survival rate of 87.3% in Spain in 2016 [43]. These variations in median survival and survival rates across the literature can be attributed to the specific characteristics of each region, particularly regarding living standards, socioeconomic conditions, and the quality of technical resources available for the management of rectal cancer [4] [44]-[46].

The survival analysis reveals notable associations, particularly concerning marital status. Patients who were married demonstrated a median survival of 28 months, with an average survival of 33.5 months (95% CI: 23.0 - 43.9), whereas unmarried patients had a significantly lower median survival of 16 months and an average survival of 18.9 months (95% CI: 14.8 - 23.1). The log-rank test yielded a

statistically significant p-value of 0.028, suggesting a considerable impact of marital status on survival outcomes. This aligns with existing research indicating that married patients often benefit from increased social support, leading to earlier diagnosis, better adherence to treatment, and improved overall survival [42]. While gender, age, Performance status, T staging, N staging, M staging and EBRT intent did not yield statistically significant differences in survival in this cohort, the trends observed may warrant further investigation in larger studies to explore potential nuances in these subgroups [22]-[24]. The absence of statistically significant differences in survival based on disease stage may be attributed to the limited sample size and the complex interplay of factors influencing cancer progression [23]. We hypothesize that the significant burden experienced by patients after surgery contributes to the elevated mortality rate among those who are otherwise in good health. These insights will facilitate important discussions with surgical departments about improving peri-operative and post-operative care for rectal cancer patients.

Limitations: This study has some limitations that should be acknowledged. Firstly, its single-center design may restrict the generalizability of the findings, as they may not reflect broader patient populations or practices in different settings. Secondly, the retrospective nature of the data collection introduces potential bias, including incomplete or inconsistent records, which could affect the reliability of the results. Additionally, the small sample size limits the statistical power and may hinder the ability to draw definitive conclusions. These factors underscore the need for caution when interpreting the results and suggest that further multi-center studies with larger cohorts are warranted to validate our findings. Regarding the survival analysis, the study suffers from a lack of statistical power, limiting the detection of effects. The observed trends (e.g., longer survival in men and those under 50) must be interpreted with caution. The association significant with marital status is consistent with the literature (role of social support) [9]. An analysis of a multivariate type Cox model is recommended when the cohort is larger.

5. Conclusion

The management of rectal cancer in the Democratic Republic of Congo remains largely unstandardized, as highlighted by our findings. While the median age of diagnosis is 51 years, the disease impacts individuals across a wide age spectrum, ranging from 22 to 74 years in our cohort. Alarmingly, the overall 3-year survival rate is among the lowest reported globally and within sub-Saharan Africa. To enhance the prognosis for rectal cancer patients in our region, it is crucial to improve socioeconomic conditions, reduce treatment delays, and optimize surgical facilities. These changes could lead to significantly better outcomes for those affected by this challenging disease.

Acknowledgements

We would like to express our sincere gratitude to all those who contributed to this

study. We thank the Centre Hospitalier Nganda MultiDisciplinary Team members who are reviewing the treatment strategy of all patients treated in the hospital.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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