

Prolonged Hospitalization During Concurrent Chemoradiotherapy for Cervical Cancer: Frequency, Clinical Profile, and Treatment Continuity - Experience from the National Institute of Oncology in Rabat

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Abstract

Original Research Article

Background: Concurrent chemoradiotherapy (CCRT) followed by brachytherapy is the standard curative treatment for locally advanced cervical cancer. In patients hospitalized during treatment, acute toxicity, clinical decompensation, and organizational constraints may prolong the hospital stay and disrupt treatment continuity. **Objective:** To describe the frequency of prolonged hospitalization, the clinical and tumor profile of hospitalized patients, and the main indicators of treatment delivery. **Methods:** This descriptive retrospective cohort included 260 women with histologically confirmed cervical cancer who were hospitalized during definitive CCRT at the National Institute of Oncology in Rabat between January 2024 and December 2025. For all patients, hospital length of stay (LOS) corresponded to the length of the index stay, defined as the first documented hospitalization during CCRT. Prolonged hospitalization was defined as an index stay of ≥ 7 days. Results are presented as numbers, percentages, and medians with interquartile range (IQR). **Results:** The median index length of stay was 7 days (IQR: 4–8), and 155 patients (59.6%; 95% CI: 53.6–65.4) had prolonged hospitalization. FIGO stage III–IVA disease was present in 206 patients (79.2%), baseline hemoglobin < 10 g/dL in 164 (63.1%), and malnutrition in 133 (51.2%). Grade ≥ 3 toxicity was reported in 166 patients (63.8%). Blood transfusion and intravenous antibiotic therapy were required in 164 (63.1%) and 189 patients (72.7%), respectively. Radiotherapy was interrupted in 86 patients (33.1%). Overall, 151 (58.1%) received at least five cycles of cisplatin, 188 (72.3%) completed brachytherapy, and 112 (43.1%) had an overall treatment time > 56 days. 30-day readmission occurred in 112 patients (43.1%), and 14 in-hospital deaths (5.4%) were recorded. **Conclusion:** In this selected cohort of patients hospitalized during CCRT, nearly six out of ten had an index stay of ≥ 7 days. The high frequency of severe toxicities, transfusion requirements, anti-infective treatments, and treatment disruptions highlights the value of a proactive supportive care pathway and close coordination among inpatient care, external beam radiotherapy, chemotherapy, and brachytherapy.

Keywords: Cervical cancer; concurrent chemoradiotherapy; hospitalization; length of stay; radiotherapy interruption; toxicity; Morocco.

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INTRODUCTION

Cervical cancer remains a major cause of morbidity and mortality among women, with a particularly substantial burden in low- and middle-income countries [1,2]. Although it is largely preventable through human papillomavirus vaccination and screening, many patients still present with locally advanced disease. The 2018 FIGO classification incorporates imaging and pathological findings when available and recognizes pelvic or para-aortic nodal involvement as stage IIIC [3].

For locally advanced cancers, curative treatment is based on pelvic external beam radiotherapy, concomitant cisplatin-based chemotherapy, and image-guided brachytherapy [4]. Randomized trials and meta-analyses have shown a survival benefit with CCRT compared with radiotherapy alone [5–8]. However, this benefit is accompanied by an increase in acute hematologic, gastrointestinal, renal, and general toxicities [8–10].

Hospitalization may be required in cases of severe anemia, infection, dehydration, renal impairment,

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uncontrolled pain, or tumor-related complications. A prolonged stay may require substantial resources and coincide with omitted chemotherapy cycles, radiotherapy interruption, or delayed brachytherapy. In several series, an overall treatment time exceeding approximately 56 days has been associated with reduced pelvic control [11–14].

Data describing LOS during CCRT remain limited in North African centers. The present study aimed to describe the frequency of prolonged hospitalization, the baseline profile of hospitalized patients, and the main indicators of treatment continuity at the National Institute of Oncology in Rabat.

MATERIALS AND METHODS

Study design and population

This was a single-center, descriptive retrospective cohort study conducted in the Department of Radiation Oncology at the National Institute of Oncology in Rabat. All eligible patients hospitalized during definitive CCRT for cervical cancer between January 1, 2024, and December 31, 2025, were considered. The manuscript was structured in accordance with the STROBE guidelines [15].

Women with histologically confirmed cervical carcinoma, nonmetastatic disease requiring definitive external beam radiotherapy combined with concomitant chemotherapy and brachytherapy, and at least one documented hospital stay during treatment were included. Records involving palliative radiotherapy, metastatic disease at presentation, postoperative CCRT, prior pelvic radiotherapy, or an inability to determine the length of the index stay were excluded. The final analysis included 260 patients, all with an analyzable index length of stay.

Treatment characteristics

Treatment decisions were made at a multidisciplinary tumor board. External beam radiotherapy delivered a pelvic dose of 46 Gy in 23 fractions of 2 Gy, five fractions per week, using three-dimensional conformal radiotherapy, intensity-modulated radiotherapy (IMRT), and/or volumetric modulated arc therapy (VMAT). A nodal boost was administered when indicated. Concomitant chemotherapy was based primarily on weekly cisplatin at 40 mg/m², capped at 70 mg per cycle. High-dose-rate brachytherapy, either intracavitary or hybrid intracavitary/interstitial, followed a regimen of 28 Gy in four fractions of 7 Gy. The organizational goal was to

complete the entire treatment within a maximum of 56 days [4,11].

Variables and definitions

The variables collected included age, ECOG performance status, comorbidities, malnutrition, baseline hemoglobin, renal function, histology, 2018 FIGO stage, nodal involvement, hydronephrosis, radiotherapy technique, number of cisplatin cycles, brachytherapy completion, radiotherapy interruptions, overall treatment time, and in-hospital events. Toxicities were graded according to CTCAE version 5.0 [16].

For all patients, the index stay was defined as the first documented hospitalization during CCRT. Its duration was calculated in calendar days from the date of admission to the date of discharge or in-hospital death, inclusive. The primary outcome was prolonged hospitalization, defined a priori as an index stay of ≥ 7 days. Secondary descriptive outcomes included grade ≥ 3 toxicity, transfusion, intravenous antibiotic therapy, radiotherapy interruption, administration of at least five cisplatin cycles, brachytherapy completion, an overall treatment time > 56 days, 30-day readmission, and in-hospital death.

Statistical analysis

Categorical variables were summarized as numbers and percentages. Available continuous variables were described by their median and IQR. The 95% confidence interval for the proportion of prolonged hospitalizations was calculated using the Wilson method. Because the data provided were aggregated, no comparisons stratified by LOS, p values, or multivariable regression were reported in this version. This approach avoids attributing to LOS associations that cannot be established without individual-level data.

RESULTS

Baseline characteristics

All 260 patients had an analyzable index length of stay. Among them, 82 (31.5%) were aged 65 years or older, 58 (22.3%) had an ECOG performance status ≥ 2 , and 95 (36.5%) had at least one major comorbidity. Malnutrition was documented in 133 patients (51.2%), and baseline hemoglobin < 10 g/dL in 164 (63.1%). Squamous cell carcinoma accounted for 202 cases (77.7%). Disease was classified as FIGO stage III–IVA in 206 patients (79.2%), with pelvic nodal involvement in 177 (68.1%), para-aortic nodal involvement in 54 (20.8%), and hydronephrosis in 81 (31.2%).

Table 1: Clinical and tumor characteristics of the cohort (N=260)

Characteristic	n	%
Age ≥ 65 years	82	31.5
ECOG performance status ≥ 2	58	22.3
At least one major comorbidity	95	36.5
Documented malnutrition	133	51.2
Baseline hemoglobin < 10 g/dL	164	63.1

Characteristic	n	%
Baseline renal impairment	14	5.4
Squamous cell carcinoma	202	77.7
FIGO stage III–IVA	206	79.2
Pelvic nodal involvement	177	68.1
Para-aortic nodal involvement	54	20.8
Hydronephrosis	81	31.2

Abbreviations: ECOG, Eastern Cooperative Oncology Group; FIGO, International Federation of Gynecology and Obstetrics.

Treatment delivery

An IMRT or VMAT technique was used in 165 patients (63.5%). Overall, 151 patients (58.1%) received at least five cycles of concomitant cisplatin, and 188

(72.3%) completed the planned brachytherapy. An unplanned interruption of radiotherapy occurred in 86 patients (33.1%). The median overall treatment time was 50 days and exceeded 56 days in 112 patients (43.1%).

Table 2: Treatment characteristics and treatment continuity (N=260)

Treatment indicator	n or value	%
IMRT/VMAT technique	165	63.5
≥5 cycles of concomitant cisplatin	151	58.1
Brachytherapy completed	188	72.3
Unplanned radiotherapy interruption	86	33.1
Overall treatment time, median	50 days	—
Overall treatment time >56 days	112	43.1

Abbreviations: IMRT, intensity-modulated radiotherapy; VMAT, volumetric modulated arc therapy.

Length of stay and clinical events

The median index length of stay was 7 days (IQR: 4–8). An index stay of ≥7 days occurred in 155 patients, corresponding to 59.6% of the cohort (95% CI: 53.6–65.4). A maximum grade ≥3 toxicity was reported in 166 patients (63.8%). Blood transfusion and

intravenous antibiotic therapy were required in 164 (63.1%) and 189 patients (72.7%), respectively. Readmission within 30 days was observed in 112 patients (43.1%), and 14 in-hospital deaths (5.4%) were recorded.

Table 3: Length of stay, toxicities, and in-hospital events (N=260)

In-hospital indicator	n or value	%
Index length of stay, median (IQR)	7 days (4–8)	—
Prolonged hospitalization (index stay ≥7 days)	155	59.6
Grade ≥3 toxicity	166	63.8
Blood transfusion	164	63.1
Intravenous antibiotic therapy	189	72.7
30-day readmission	112	43.1
In-hospital death	14	5.4

Abbreviations: LOS, length of stay; IQR, interquartile range. The number of patients with grade ≥3 toxicity corresponds to 63.8% of 260 patients.

DISCUSSION

This retrospective cohort describes 260 women who required hospitalization during definitive CCRT for cervical cancer. The main finding is the high frequency of index stays lasting at least seven days: 155 patients, or nearly six out of ten. This proportion should be interpreted in a population already selected by the need for hospitalization; it does not represent the risk of hospitalization among all women treated with CCRT at the center.

The baseline profile reflected substantial clinical and tumor-related vulnerability. Nearly four out of five patients had FIGO stage III–IVA disease, 68.1% had pelvic nodal involvement, 63.1% had baseline

hemoglobin <10 g/dL, and 51.2% had documented malnutrition. Anemia may reflect tumor bleeding, nutritional deficiencies, inflammation, or advanced disease and may complicate cisplatin administration as well as tolerance of radiotherapy [17]. The frequency of transfusions observed in this cohort should therefore be considered a marker of supportive care needs, without inferring a protective or adverse causal effect.

Severe toxicities and inpatient treatment requirements were also frequent: 63.8% of patients had grade ≥3 toxicity, 63.1% received a transfusion, and 72.7% received intravenous antibiotic therapy. These findings support rigorous weekly monitoring of the complete blood count and renal function, early

nutritional assessment, hydration and antiemetic protocols, and prompt identification of infections. However, they do not allow the main reason for each stay to be identified, because this distribution was not available in the aggregated data analyzed.

Treatment continuity is a central concern. Radiotherapy was interrupted in 33.1% of patients, and 43.1% had treatment lasting more than 56 days, although the overall median was 50 days. Several studies have associated prolongation beyond 56 days with poorer pelvic control [11–14]. The proportion of patients who received at least five cisplatin cycles was 58.1%, and the proportion who completed brachytherapy was 72.3%. These data support early scheduling of brachytherapy, an explicit plan to continue radiotherapy during hospitalization when the clinical condition permits, and daily multidisciplinary reassessment of barriers to treatment and discharge [4].

30-day readmission occurred in 43.1% of patients, and in-hospital mortality was 5.4%. In a resource-constrained setting, these indicators justify a structured transition pathway at discharge, combining education about warning signs, close laboratory monitoring, rapid access to an unscheduled consultation, and social support coordination. Barriers related to transportation, accommodation, or outpatient support may also influence length of stay and should be distinguished from medical indications [18,19].

CONCLUSION

Among 260 women hospitalized during definitive CCRT for cervical cancer at the National Institute of Oncology in Rabat, the median index length of stay was 7 days, and 59.6% had an index stay of ≥ 7 days. The cohort was characterized by high proportions of advanced disease, anemia, malnutrition, and severe toxicities, together with substantial requirements for transfusion and intravenous antibiotic therapy. Radiotherapy interruptions and treatments lasting more than 56 days were frequent. A proactive supportive care pathway, close coordination of the different components of CCRT, and structured follow-up after discharge could help ensure safe care and preserve treatment continuity. Causal and predictive analyses will need to be performed using individual-level data.

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