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Survival of patients with clinical stage III and IV cervical cancer undergoing nephrostomy: Descriptive study of a single center.

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Abstract

Introduction: A quarter of women with gynecological neoplasms present with obstruction in the urinary tract, secondary to tumor infiltration or extrinsic compression of the ureters. Nephrostomy is an interventional clinical alternative to improve obstructive nephropathy and avoid dialysis treatment in a cancer patient with hydronephrosis. The objective of this study was to determine the survival of patients with cervical cancer who underwent nephrostomy.

Methodology: The present observational study was carried out at Solón Espinosa Ayala Hospital "Solca-Núcleo de Quito" from January 2014 to December 2018. The sample calculation was nonprobabilistic. Cases of patients with cervical cancer who underwent nephrostomy were included. The variables were age, overall survival, survival with nephrostomy, histological type of cervical neoplasia, stage, oncological treatment after nephrostomy, complications, and response to treatment. For the analysis, the Kaplan – Meier method was used. Survival was analyzed according to ECOG functional stages.

Results: Ninety-six cases were included in the study. The median survival after nephrostomy placement was 277 days (9.2 months), and the median overall survival was 462 days (15 months). Patients with ECOG-0 had an overall survival of 625 days (20.8 months); those with ECOG 1, 2, and 3 had an overall survival of 437 days (14.5 months) (P= 0.013).

Conclusion: In this study, patients with cervical cancer who had locally advanced and metastatic disease with ECOG 0 benefited the most from the nephrostomy procedure with improved survival. Patients with locally advanced and metastatic disease with ECOG scores of 2 and 3 did not improve their overall survival with nephrostomy placement. Fifty percent of them progressed despite receiving cancer treatment, but they avoided admission to dialysis programs. The main complication after placement of the nephrostomy catheter was an infection.

Keywords:

DCS: cervical neoplasms, hydronephrosis, percutaneous nephrostomy, survival analysis

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Introduction

Concurrent chemoradiotherapy is the standard of care for locally advanced cervical cancer and is potentially curative. The best response rates occur with an earlier stage (IB to IIB) versus a more advanced stage (III to IVA) [1, 2] .

Metastatic disease develops in 15% to 61% of patients, usually within the first two years of completion of treatment, and is generally not curable [3, 4]; in these cases, it is challenging to offer a definitive treatment since these patients have impaired renal function and uremia as a consequence of obstructive uropathy [5], the same that occurs on several occasions in previously treated patients who had no evidence of recurrent disease; however, they developed hydronephrosis due to ureteral invasion in pelvic fibrosis. Patients may be symptomatic or asymptomatic with high uric acid, urea, creatinine, and electrolyte levels [5]. Urinary diversion via percutaneous nephrostomy (PCN) is the most commonly performed technique because it restores renal function, improves the quality of life, and allows most patients to receive specific palliative treatment for the disease. Cervical cancer and curative therapy in some well-defined cases [6].

A case series of 102 patients illustrated the clinical spectrum of malignant ureteral obstruction; obstruction was bilateral in 68% of patients. Initial management with a percutaneous nephrostomy or ureteral stent was successful in 95% of patients. Cases: Despite successful decompression, 53% of patients developed complications, primarily urinary tract infection and obstruction of nephrostomy tubes or stents. Survival is generally poor, with a median of seven months, reflecting the advanced stage of malignancy in such patients [7].

A quarter of women with gynecological neoplasms present with some degree of obstruction in the urinary tract during the disease; in 70% of cases, it is secondary to tumor infiltration or extrinsic compression of the ureters. Limited survival after bypass (median between 6.5 and 26 weeks) and a high rate of complications have been found in these patients [8]. It should be considered that treatment is always a challenge in the advanced stages of neoplastic disease. Therefore, the patient's quality of life, pain relief, hygiene assurance, and psychological care should be prioritized [9]. Try to replace or avoid the temporary treatment of renal function replacement therapies by using an indwelling nephrostomy tube. Two groups of patients with cervical cancer are considered for performing shunt nephrectomies: first, women with potentially curable neoplasms who have not received treatment and, second, those who were exposed to pelvic radiotherapy who do not have clinical evidence of disease and have obstruction due to other causes [8]. The objective of this study was to determine the survival of patients with cervical cancer who underwent nephrostomy.

Materials and methods

Study design

The present study is observational, analytical, and retrospective.

Study area

The study was carried out in the statistics department of Solón Espinosa Ayala Hospital "Solca-Núcleo de Quito". The study period was from January 1, 2014, to December 31, 2018.

Universe and sample

The population was made up of all the patients registered in the institution. The sample size calculation was nonprobabilistic, census type, in which all incident cases in the study period that met the admission criteria were included.

Participants

Cases of patients diagnosed with cervical cancer who underwent nephrostomy associated with their oncological disease were included. Patients with a diagnosis of double primary cancer, patients with treatment abandonment, patients with a double J catheter, patients without evaluation of treatment with imaging studies, and patients who had undergone placement of a nephrostomy catheter outside the institution were excluded. Additionally, cases with incomplete records were excluded from the analysis.

Variables

The variables were age, overall survival after nephrostomy, histological type of cervical neoplasia, stage, oncological treatment after nephrostomy, response to treatment, and complications of nephrostomy. Response to oncological therapy was assessed with oncological computed tomography with RECIST criteria: complete response, partial response, disease stability, and disease progression.

Procedures, techniques, and instruments

Demographic data were collected from the computer system of Solca Quito, reviewing the file of each of the patients; for the area of origin, the front sheet of the system was reviewed; for the clinical stage, the medical history and staging studies were reviewed, and pathology reports were obtained from the Pathology Service database with their respective histopathological diagnoses. Posttreatment evaluation imaging results were examined to determine treatment response.

The reports of the nephrostomy intervention procedures were obtained from the imaging service, where the complications derived from the system are reported, and whether they were unilateral or bilateral nephrostomy. The evolution before nephrostomy catheter placement was reviewed to obtain a subjective evaluation of the ECOG.

The cases were followed up for one year, identifying the final event as alive or dead.

Upon completing the required data, these were entered into the statistical program IMB SPSS 22.0 for their respective analysis. Patients with cervical cancer were classified according to histopathological type to determine their prevalence; this was determined by the report of the pathology service of the SOLCA Quito Hospital.

Bias avoidance

The researchers were trained in data collection to guarantee the reliability of the information. A double checklist was used to include all possible cases. The data were validated and curated by the principal investigator René Muñoz.

Statistical analysis

Descriptive and inferential statistics were used in the analysis. Continuous variables were expressed as the means ± standard deviation (SD) for normal distributions and as the median (Me) and interquartile range (IR) for nonnormal distributions. For the survival analysis, the Kaplan–Meier method was used. Its statistical significance with a P value less than 0.05 was determined by the log rank method, and the chi-square test was used for qualitative variables. For the quantitative variables, Student's t test was used. The statistical package used was SPSS 22.0 analysis for PC (Armonk, NY, IBM Corp), licensed to the Central University of Ecuador.

Results

Study participants

The study included 96 analyzable cases (Figure 1).

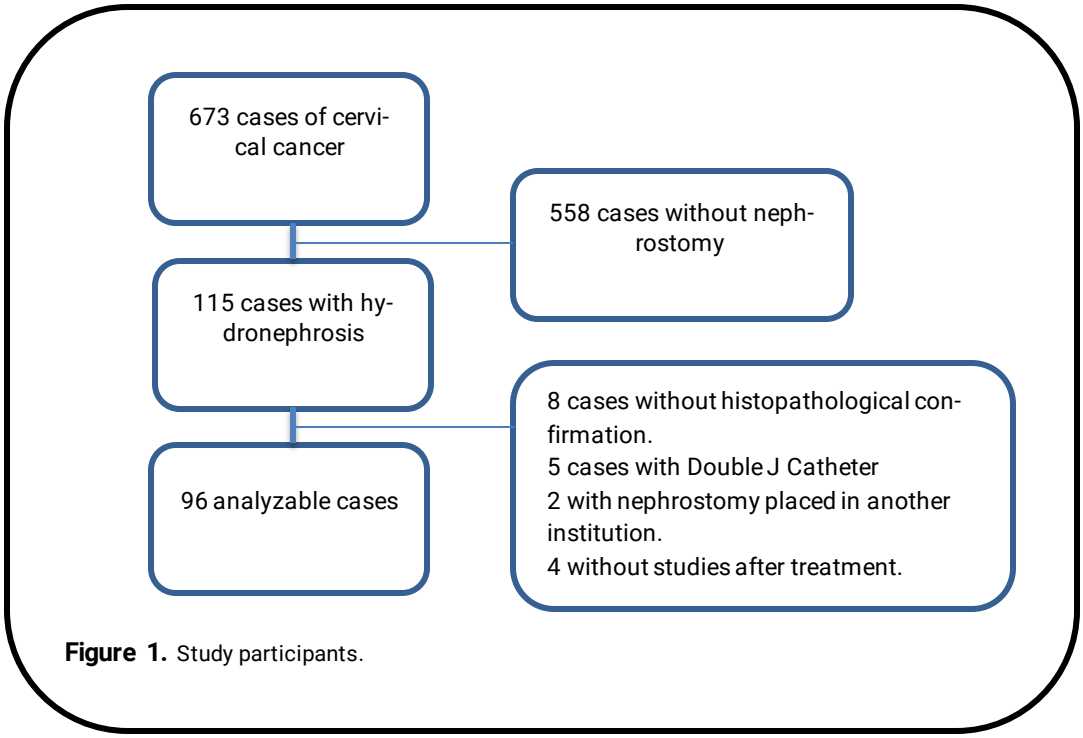

Figure 1. Study participants.

Characteristics of the participants

The age of the group was 47 ±13 years; 75% belonged to rural areas, and 25% belonged to urban sites (Table 1). Clinical stage IIIb 31.3%, clinical-stage IVa 14.6%, clinical-stage IVb 50% and clinical-stage IIIb + progression 4.2%; the most common histopathological diagnosis was squamous 94.8% (Table 1). Before placement of the nephrostomy, the ECOG scores of the patients were as follows: ECOG 0: 11.5%, ECOG 1: 32.3%, ECOG 2: 9.4%, ECOG 3: 3.1%. A total of 43.8% of the patients did not have an ECOG record in the evolution notes. A total of 11.5% of the patients underwent bilateral nephrostomy placement (Table 1).

Table 1. Description of the study group

Variable		Frequency	Percentage
Origin area	Rural	72	75%
	urban	24	25%
clinical stage	IV b	48	fifty%
	IIIb	30	31%
	IV to	14	fifteen%
	III b + Progression	4	4%
histopathological	Scaly	91	94.8%
	adenocarcinoma	5	5.2%
ECoG	Echo Unknown	42	43.8%
	Echo 1	31	32.3%
	Echo 0	eleven	11.5%
	Echo 2	9	9.4%
	Echo 3	3	3.1%
Bilateral Nephrostomy	No	85	88.5%
	Yes	eleven	11.5%
Actual state	Dead	82	85.4%
	Alive	14	14.6%

Complications

There were 18 immediate complications and 65 late complications, of which the majority were infectious (Table 2).

Table 2. Nephrostomy complications.

Variable	Complication	Frequency	Percentage
Immediate complications n=18	Infection	13	72.1%
	bleeding	3	16.6%
	Hematoma	two	11.1%
Late complications n=65	Infection	59	91.0%
	Displacement	6	9.0%

Evolution

After nephrostomy placement, 54 patients (56.3%) received treatment. A total of 61.1% received chemotherapy based on taxanes and platinum, 22.2% received radiotherapy, and 16.7% received chemotherapy and radiotherapy. Of the 54 patients treated, the response to treatment was complete in 13%, partial in 18.5%, stable in 18.5% of cases, and 50% progressed (Table 3). When divided by clinical stage, it was identified that of the patients with clinical settings III-b and IV-a, 50% received treatment, with clinical stage IV-b, 60.4% received treatment, and with clinical setting IIIB + progression, 75% received treatment. % received treatment (Table 3). Seven cases with complete response to treatment, ten subjects with partial response, and 10 with stability were obtained. At 27 points, the disease progressed (Table 3). No patient admissions to renal function substitute programs were recorded after placement of the nephrostomy.

Table 3. Response to treatment in patients with nephrostomy.

Variable	Complete answer n=7	partial answer n=10	Stability n=10	Progression n=27	No treatment n=42	Total n=96
IIIb	3 (10.0%)	1 (3.3%)	2 (6.7%)	9 (30%)	15 (50%)	30
IV to	2 (14.34%)	2 (14.3%)	0	3 (21.4%)	7 (50%)	14
IV b	2 (4.2%)	6 (12.5%)	7 (14.6%)	14 (29.2%)	19 (39.6%)	48
III b + progression	0	1 (25%)	1 (25%)	1 (25%)	1 (25%)	4

Figure 2. Kaplan Meier graph of post-nephrostomy survival of study patients.

Survival

At the end of the study, 82/96 patients had died (85.4%) (Figure 2 & 3). The mean survival after placing the nephrostomy until the end of the study was 277 days (9.2 months). The mean overall survival from the initial cancer diagnosis with its respective staging until the end of the study was 462 days. (15 months), the minimum survival after nephrostomy was 20 days attributable to hospital mortality, and initial mortality from 25 days was also found, similarly attributable to hospital mortality. For the patients with ECOG-0, the overall survival was 625 days (20.8 months); with ECOG 1, 2, and 3, it was 437 days (14.5 months) P= 0.013 (Figure 4).

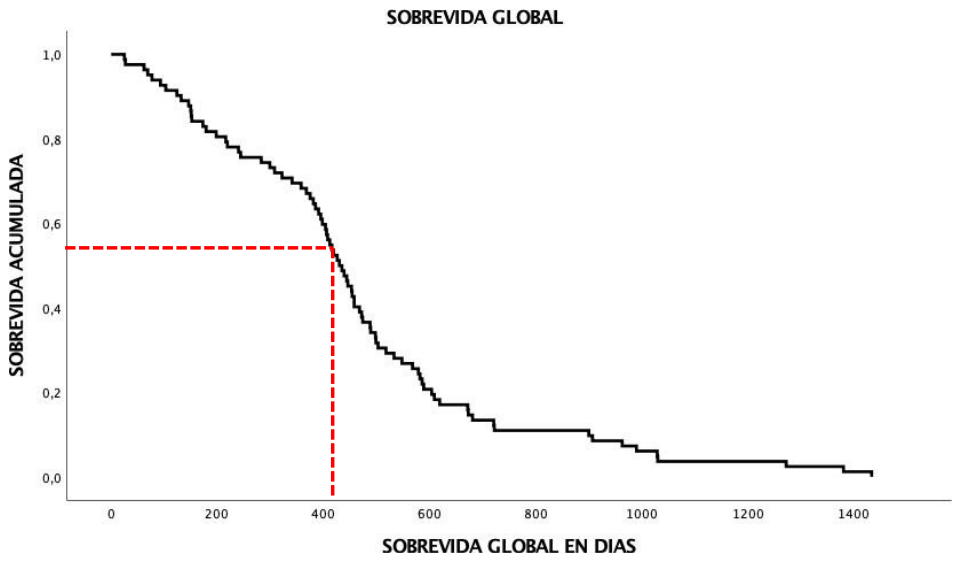

Figure 3. Kaplan Meyer graph of overall survival of the study patients.

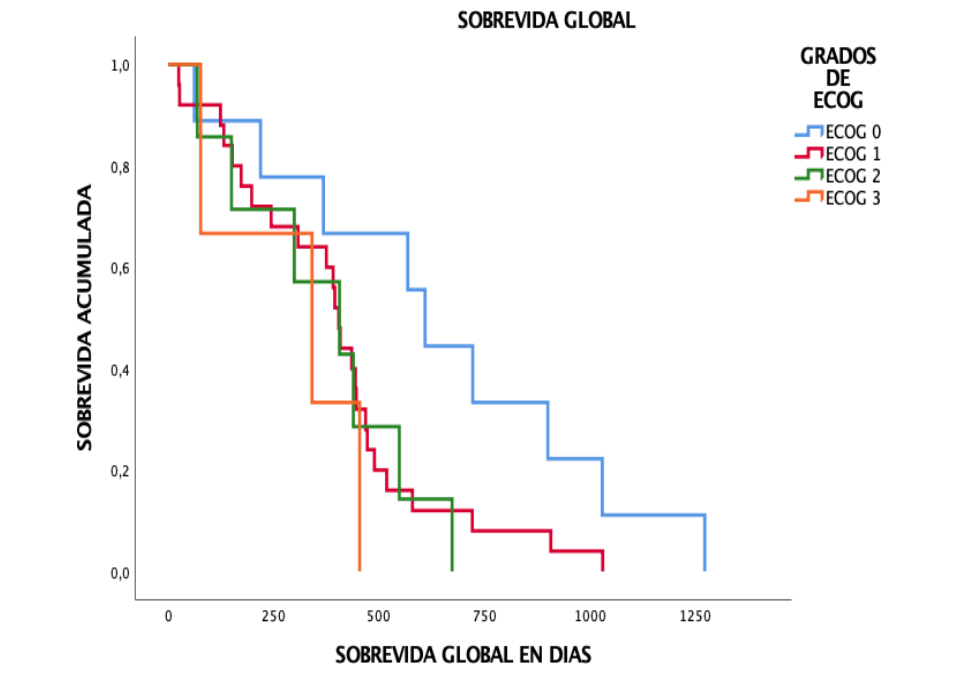

Figure 4. Kaplan Meyer graph of survival of patients with different clinical stages.

Discussion

In the study carried out, it is observed that the age at diagnosis of cervical cancer is in a young population, with an average of 47 years; in the publication of the National Registry of Tumors of SOLCA Quito, in 2017, the trend of incidence according to age ranged from 30 to 65 years [1], the same as the population in this study. In the United States, the median age for cervical cancer diagnosis is 48 years, with only 5.7% of cases diagnosed in women 85 years of age or older [10]. Of the 96 patients included in the study, it was observed that the highest percentage belonged to rural areas, 75%, which is in relation in first place to the rate of metastatic stages at diagnosis, that is, clinical-stage IVB, which in the studio constitutes 50% of the patients. This finding could be because in rural areas of Ecuador, screening or early detection is less common, there is minimal access to prevention programs such as immunizations at school age and adolescence, and probably the signs and symptoms that patients may present are related to other pathologies such as infectious processes, which constitutes a late diagnosis and a worse prognosis for patients. This percentage is above the global cancer statistics report of 60% for developing countries [6].

Regarding survival and ECOG, even though many patients did not have this assessment in the evolution before nephrostomy catheter placement, a trend toward better survival was observed in those patients with ECOG 0, both in overall survival as postnephrostomy survival, concerning ECOG 1, 2, and 3, which could be related to the fact that asymptomatic patients or those with minimal symptoms present an early stage of their disease.

In the present study, patients with clinical stages IIIB and IVA represented 45.6%, and 50% of the patients had clinical setting IVB, representing a high percentage of diagnosis of metastatic stages and a worse prognosis about their diagnosis. Initial staging had high mortality (85.4%). In this stage, the therapeutic alternatives are of a palliative nature. Therefore, their functional status will be diminished, and in some of them, this was a factor in abandoning treatment.

It has been shown that a quarter of women with gynecological neoplasms present with some degree of obstruction in the urinary tract during the disease; in 70% of cases, it is secondary to tumor infiltration or extrinsic compression of the ureters. Limited survival after nephrostomy placement has been found in these patients, with a median between 6.5 and 26 weeks (6 months) and a high rate of complications [4]. In the present study, the median survival after nephrostomy placement was 277 days (9.2 months). The global survival of 462 days (15 months) is slightly higher than that reported regionally by Cordeiro et al., where the mean overall survival was 144 days (4.8 months), with a mortality of 80% one year after the procedure [11]. Overall survival is poor, with a median of seven months [7]; this difference in survival could be due to optimal functional status, clinical stage III, and specific oncological treatment. The worst survival was related to the metastatic clinical stage at diagnosis and lack of specific treatment. The patients who had the best survival were those with ECOG 0 before placement of the nephrostomy and clinical stage III or IV who could receive complete treatment.

In the Sanchez-Periut report, it was identified that among the advantages of performing nephrostomy is the possibility of improving the renal function of patients and then administering oncospecific treatment in 25% of cases with radiotherapy and palliative radiochemotherapy, with 32% of patients surviving long enough under various forms of specific primary treatment after nephrostomy [5]. In this regard, 56.3% of the patients received treatment after

nephrostomy catheter placement in the present study, 25% more patients than in the previously mentioned studies; thus, 61.1% received chemotherapy, 22.2%, 16.7% chemotherapy, and radiotherapy.

Generally, patients with malignancy are susceptible to infections due to reduced host immunity; Dudley et al. showed that infection (70%) and catheter blockages (65%) were common complications of nephrectomies [5]; in the study patients, the infection presented immediately in 18.7%, and late in 67.8%, the early infectious processes could be subject to procedures, cultural level of the patient and origin. These are considered modifiable factors with timely primary health intervention.

In general, two groups of patients with cervical cancer were considered for performing shunt nephrectomies: first, women with potentially curable neoplasms who have not received treatment and, second, those who were exposed to pelvic radiotherapy, which has no clinical evidence of disease and has an obstruction from other causes [8]. We want to propose a third group of women with potentially noncurable neoplasms receiving palliative treatment to improve renal function and avoid admission to dialysis programs. These three groups have different survival rates and must be differentiated in subsequent prospective studies. A weakness of the present study is that renal function tests were not performed during the disease, which should be included in future studies.

Conclusions

In this descriptive study, patients with cervical cancer who had locally advanced and metastatic disease with ECOG 0 benefited the most from the nephrostomy procedure with improved survival. Patients with locally advanced and metastatic disease with ECOG scores of 2 and 3 did not improve their overall survival with nephrostomy placement. Despite receiving cancer treatment, 50% of them progressed; however, they did not require admission to program substitutes for renal function. The main complication after placement of the nephrostomy catheter was infection from 7 days to 6 months after placement.

Editor's Note

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Abbreviations

ECOG: of the acronym "Eastern Cooperative Oncology Group."

Administrative information

Additional Files

The authors declare none.

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Author contributions

María José Muñoz Viteri: conceptualization, validation, visualization, methodology, project management, writing: review and editing.

René Arturo Muñoz Bermeo: conceptualization, data curation, formal analysis, fundraising, research, resources, software, writing - original draft.

Henry Marcelo Caballero Narváez: conceptualization, data curation, formal analysis, fundraising, research, resources, software.

All authors read and approved the final version of the manuscript.

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Availability of data and materials

Data availability is available upon request to the corresponding author. No other materials were reported.

Statements

Ethics committee approval

It does not apply to observational studies with a review of databases or medical records.

Consent to publication

Consent to publication does not apply to studies that do not publish explicit images such as CT scans, MRIs, and physical exam images.

Conflicts of interest

The authors declare that they have no conflict of interest or competence.

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