

# Prevalence and Survival Rate of Advanced Stage Cervical Cancer Patients with Obstructive Uropathy in a Tertiary Hospital

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## Abstract

**Introduction:** This study aims to determine the prevalence and survival rate of advanced cervical cancer patients with obstructive uropathy based on grade of hydronephrosis, type of hydronephrosis, deobstruction action, type of deobstruction, clinical stage, and cancer cell type.

**Method:** This research is a descriptive analytical study with a cross-sectional retrospective approach. Samples were obtained from medical records of patients with stage IIIB, IVA and IVB cervical cancer who were treated at RSUD Dr. Saiful Anwar Malang in 2016–2023. Sampling was carried out using the total sampling method.

**Result:** Of the 171 patients, the majority of patients had stage IIIB cervical cancer (71.9%), moderate (72.5%) and bilateral (90.1%) hydronephrosis were found in the majority of patients. SCC dominated the sample (82.5%) and was followed by ADC (14.6%). Most patients underwent deobstruction (64.3%) with DJ stent insertion being the most common type of deobstruction (84.5%). Patients with stage IVB have a lower survival rate than IIIB and IVA ( $p > 0.05$ ). Patients with SCC had lower survival (3%) than ADC (5%). The average survival rate for the three grades of hydronephrosis was not significantly different ( $p > 0.05$ ). Patients undergoing deobstruction showed a higher survival rate (5%) ( $p < 0.05$ ). DJ stent, PCN, and UCS insertion showed similar survival rates in patients ( $p > 0.05$ ).

**Conclusion:** Stage IIIB cervical cancer, moderate hydronephrosis, bilateral hydronephrosis, and SCC dominated the patients in the study. Patients with stage IVB cervical cancer, SCC, unilateral or severe hydronephrosis have a worse prognosis. The presence of deobstruction indicates a better prognosis and can be performed with PCN, DJ stent insertion, or UCS.

**Keywords:** Hydronephrosis, Cervical Cancer, Prevalence, Survival Rate, Cell Types.

**Prevalensi Dan Tingkat Kelangsungan Hidup Pasien  
Kanker Serviks Stadium Lanjut Dengan Uropati Obstruktif  
Di Rumah Sakit Tersier**

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**Abstrak**

**Pendahuluan:** Penelitian ini bertujuan untuk mengetahui prevalensi dan survival rate pasien kanker serviks stadium lanjut dengan uropati obstruktif berdasarkan derajat hidronefrosis, jenis hidronefrosis, tindakan desobstruksi, jenis desobstruksi, stadium klinis, dan tipe sel kanker.

**Metode:** Penelitian ini merupakan penelitian deskriptif analitik dengan pendekatan retrospektif cross-sectional. Sampel didapatkan dari rekam medis pasien kanker serviks stadium IIIB, IVA, dan IVB yang dirawat di RSUD Dr. Saiful Anwar Malang pada tahun 2016–2023. Pengambilan sampel dilakukan dengan metode total sampling.

**Hasil:** Dari 171 pasien, mayoritas pasien mengidap kanker serviks stadium IIIB (71.9%), hidronefrosis derajat sedang (72.5%) dan bilateral (90.1%) ditemukan pada sebagian besar pasien. SCC mendominasi pada sampel (82.5%) dan diikuti oleh ADC (14.6%). Sebagian besar pasien menjalani desobstruksi (64.3%) dengan insersi DJ stent menjadi jenis desobstruksi terbanyak (84.5%). Pasien dengan stadium IVB memiliki tingkat kelangsungan hidup lebih rendah dibanding IIIB dan IVA ( $p > 0.05$ ). Pasien dengan SCC memiliki kesintasan yang lebih rendah (3%) dibanding ADC (5%). Rata-rata kelangsungan hidup pada ketiga derajat hidronefrosis tidak jauh berbeda ( $p > 0.05$ ). Pasien yang menjalani desobstruksi menunjukkan tingkat kelangsungan hidup (5%) yang lebih tinggi ( $p < 0.05$ ). Insersi DJ stent, PCN, dan UCS menunjukkan tingkat kelangsungan hidup yang serupa pada pasien ( $p > 0.05$ ).

**Kesimpulan:** Kanker serviks stadium IIIB, hidronefrosis derajat sedang, hidronefrosis bilateral, dan SCC mendominasi pada pasien dalam penelitian. Pasien dengan kanker serviks stadium IVB, SCC, hidronefrosis derajat berat atau unilateral memiliki prognosis yang lebih buruk. Adanya desobstruksi menunjukkan prognosis yang lebih baik dan dapat dilakukan dengan PCN, insersi DJ stent, ataupun UCS.

**Kata kunci:** Hidronefrosis, Kanker Serviks, Prevalensi, Survival Rate, Tipe Sel.

**Introduction**

Cervical cancer is one of the leading causes of cancer death among females worldwide. In 2020, GLOBOCAN reported 19.3 million new cases and 10 million cancer deaths worldwide. Of these millions of cases, cervical cancer ranks as the fourth most frequently diagnosed (6.5%) and fatal (7.7%) cancer in women with 604,000 new cases and 342,000 deaths. Cervical cancer is the second most common cancer found in women in transition countries, such as Indonesia.<sup>1</sup> Squamous cell carcinoma (SCC) is found in 70% of cases and

adeno carcinoma (ADC) is found in the remainder. Cervical cancer contributes to the majority of cases of obstructive uropathy and bilateral hydronephrosis is more common (74%) than other gynaecological malignancies.<sup>2</sup> External compression from the cervical tumor or malignant spread of cervical cancer to the urinary tract are two possible causes of uropathy. This obstruction may result in hydronephrosis, renal failure, uremia, and electrolyte imbalance, all of which greatly increase the morbidity and death from cervical cancer. Severe complications of obstructive uropathy, including sepsis and uremia, may cause further deterioration of the

patient's condition and even death.<sup>3</sup> The presence of hydronephrosis worsens the condition of cervical cancer patients by reducing kidney function and also associated with increasing risk of death.<sup>4,5</sup> This study aims to determine the prevalence and survival rate of advanced cervical cancer patients with obstructive uropathy based on the grades of hydronephrosis, type of hydronephrosis, deobstruction, type of deobstruction, clinical stage, and type of cancer cells.

## Methods

This study is a descriptive analytical study with a cross-sectional retrospective approach with the population studied being patients with advanced cervical cancer who were treated at RSUD Dr. Saiful Anwar Malang, Indonesia in 2016–2023. Samples were obtained from medical records and selected based on inclusion criteria, namely patients with stage IIIB, IVA, and IVB cervical cancer confirmed by histopathology results and accompanied by complications of hydronephrosis, by excluding incomplete data. Sampling was carried out using the total sampling method.

The independent variables in this study were the grade of hydronephrosis, type of hydronephrosis, deobstruction, type of deobstruction, clinical stage, and type of cervical cancer cells. Meanwhile, the dependent variables were prevalence and survival rate.

Grade of hydronephrosis was measured using hydronephrosis grading system developed by the Society of Fetal Urology (SFU) consisting of grade I, II, III, and IV (ordinal data scale). Obstructive uropathy patients who were subjects in this study were performed with deobstruction and some were not (nominal data scale). The type of deobstructions were DJ Stent, percutaneous nephrotomy (PCN) and ureterocutaneostomy (UCS) (nominal data scale). Clinical stage of cervical cancer was measured using 2018 FIGO staging system (ordinal data scale). Type of cervical cancer cells was identified with histopathology (nominal data scale).

The data obtained were processed using Statistical Program for Social Science (SPSS) software to carry out univariate analysis for prevalence, as well as the Kaplan-Meier and log-rank tests for survival rate analysis. The ethical clearance of this study was obtained from The Health Research Ethics Committee, Faculty of Medicine Universitas Brawijaya, Malang with approval number of No. 101/EC/KEPK-S1-PD/05/2023.

## Results

There were 205 cervical cancer patients at RSUD Dr. Saiful Anwar Malang, Indonesia in 2016–2023, from this data 34 patients were excluded because 6 patients were stage IIB and IIIA and 28 other patients had incomplete medical record data. Analysis was carried out on 171 patients.

The results of the study can be seen in Table 1. Of the 171 patients, it was found that the majority (72.5%) had moderate hydronephrosis, followed by severe and mild hydronephrosis. Meanwhile, based on clinical stage, the majority of patients were diagnosed at stage IIIB (71.9%) and the remainder at stages IVA and IVB.

Then, SCC dominated in 82.5% cases followed by ADC. In addition, a small proportion of patients with SNEC (2.4%) and ASC (0.6%) were found. A total of 64.3% of patients underwent deobstruction with DJ stent insertion being the most common type of deobstruction (84.5%).

Based on Figure 1, patients with mild hydronephrosis have the greatest survival rate, followed by moderate (4%) and severe hydronephrosis (2%), but those results were statistically not significant ( $p>0.05$ ).

From Figure 2, it can be seen that patients with unilateral hydronephrosis have a shorter 2-year survival rate than bilateral ones, but those results were statistically not significant ( $p>0.05$ ).

As can be seen in Figure 3, patients with stage IVB cervical cancer had the lowest survival rate, 22% for 13 months, while IIIB was 2% and IVA was 11% in 2 years ( $p>0.05$ ). Based on Figure 4, patients with SCC had lower survival (3%) compared with ADC (5%) with a mean of 12 months and 12.7 months, but those results were statistically not significant ( $p>0.05$ ).

Regardless of technique, patients who underwent deobstruction had a higher survival rate (5%) than patients who did not (3% at 23 months) with median survival of 14.5 months and 7.5 months, respectively ( $p<0.05$ ).

Meanwhile, patients undergoing PCN showed the greatest survival rate (18%) followed by DJ stent insertion and UCS. Based on Figure 6, these three types of deobstruction have similar survival rates, but those results were statistical not significant ( $p>0.05$ ).

**Table 1. The Characteristics and 2-Year Survival of Advanced Stage Cervical Cancer Patients with Hydronephrosis (n=171)**

Variable	n	%	2-Year Survival (%)	Mean (months)	Median (months)	p-value
Grades of Hydronephrosis						
Mild	11	6.4	24 (23 months)	10.016	7	0.713
Moderate	124	72.5	4	11.723	8.867	
Severe	36	21.1	2	13.232	12.533	
Types of Hydronephrosis						
Unilateral	17	9.9	7 (23 months)	11.279	10.167	0.633
Bilateral	154	90.1	4	12.154	9.333	
Clinical Stage						
IIIB	123	71.9	2	12.319	10.167	0.245
IVA	42	24.6	11	11.439	9.667	
IVB	6	3.5	22 (13 months)	6.444	5.133	
Cancer Cell Types						
SCC	141	82.5	3	12.057	10.400	0.341
ADC	25	14.6	5	12.737	8.267	
SNEC	4	2.3	25 (13 months)	5.850	2.067	
ASC	1	0.6	100 (17 months)	18.800	18.800	
Deobstruction						
No	61	35.7	3 (23 months)	7.528	4.967	0.000
Yes	110	64.3	5	14.526	12.567	
Types of Deobstruction						
DJ Stent	93	84.5	4	14.540	12.167	0.767
PCN	11	10	18	15.452	15.400	
UCS	6	5.5	17 (19 months)	13.039	13.667	

## Discussion

This study showed that most of the samples were stage IIIB cervical cancer patients. Similar results were also found in previous studies. Although the early stage of cancer was not studied in this study, the majority of cervical cancer patients were diagnosed at advanced stages, especially IIIB. Lack of knowledge and awareness of cervical cancer and pap smears, limited access to pap smear examinations, and the low number of HPV vaccinations are several factors that cause most patients to be diagnosed at advanced stages.<sup>6,7</sup>

In this study, SCC was found in the majority of samples followed by ADC. Previous studies also showed that SCC was the most common cytological type of cervical cancer.<sup>7-9</sup> The occurrence of eversion of the endocervical columnar epithelium to the ectocervix during puberty and pregnancy makes the transformation zone susceptible to HPV infection which can cause epithelial dysplasia.

Bilateral hydronephrosis was found in 90.1% of patients followed by unilateral hydronephrosis. Similar results were obtained in a previous study where bilateral hydronephrosis dominated in cervical cancer

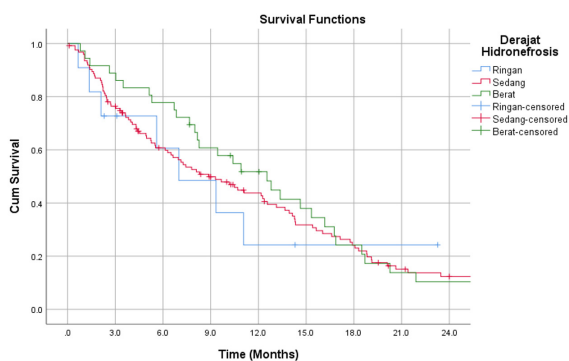


Figure 1.2-Year Survival Based on Grades of Hydroprosis

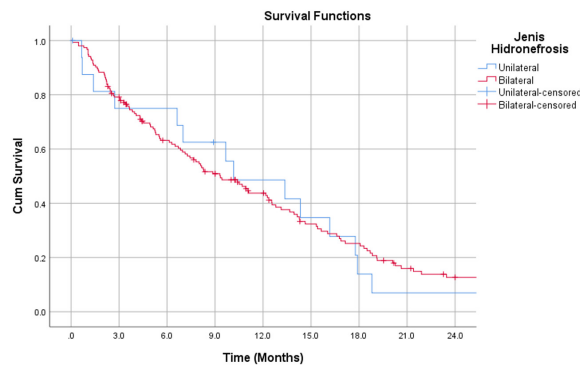


Figure 2.2-Year Survival Based on Types of Hydroprosis

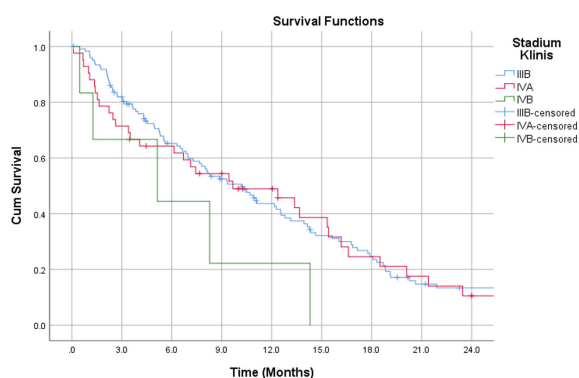


Figure 3.2-Year Survival Based on Clinical Stage of Cervical Cancer

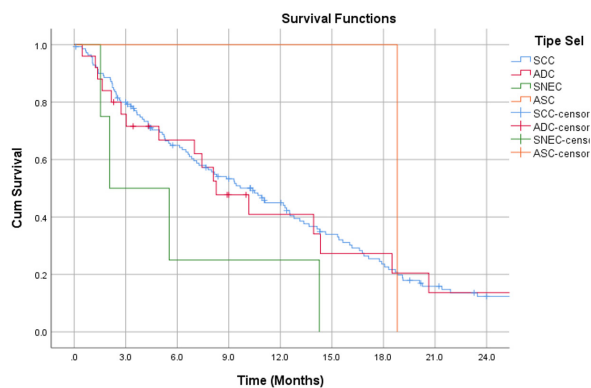


Figure 4.2-Year Survival Based on Cancer Cell Types

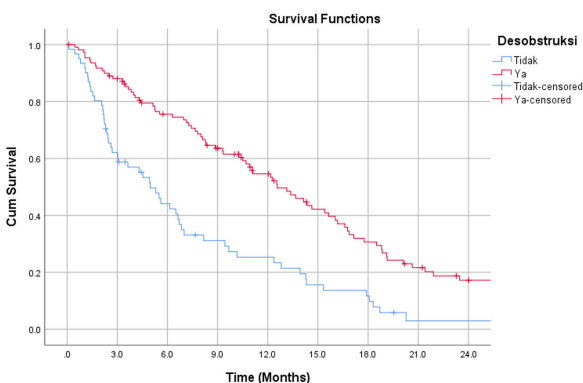


Figure 5.2-Year Survival Based on Deobstruction

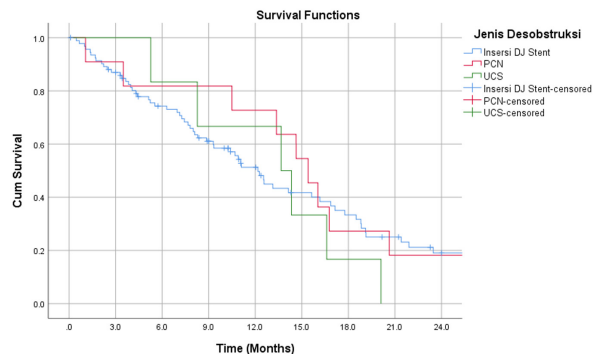


Figure 6.2-Year Survival Based on Types of Deobstruction

patients with obstructive uropathy.<sup>10</sup>

Moderate hydronephrosis was found in the majority of samples. A similar pattern was also found in previous studies. Hydronephrosis can be caused by the ureter being obstructed by an enlarged tumor or lymph nodes due to the close position of the two organs.<sup>8,10</sup>

Based on the results of statistical analysis, it was found that patients with mild degrees of hydronephrosis had the lowest survival rate, followed by moderate and severe hydronephrosis. Worsening of the grade of hydronephrosis is associated with decreased renal function, especially in patients with bilateral ones. Patients

with severe hydronephrosis can develop irreversible kidney damage which can worsen the patient's prognosis. However, the grades of hydronephrosis does not independently determine a patient's prognosis. The duration of hydronephrosis and its treatment can also affect kidney function. In addition, treatment delays, comorbidities, and more advanced cervical cancer can increase the mortality of patients with hydronephrosis.<sup>11,12</sup>

In this study, it was also found that patients who underwent deobstruction had a higher survival rate. Previous studies also reported that the 1-year survival of patients who underwent deobstruction was higher

than those who did not.<sup>13</sup> Based on the type of deobstruction, DJ stent, PCN, and UCS insertion showed similar survival rate. These results are similar to the results of a previous study which found that both PCN insertions and ureteral stents offered similar survival rates in patients with advanced cervical cancer.<sup>10</sup>

Based on the univariate analysis on clinical stage of cervical cancer, patients with stage IVB showed the lowest survival rate followed by stage IIIB and IVA, although those results were statistically not significant (based on bivariate analysis,  $p > 0.05$ ). Previous research showed that the average survival rate for stage IVA and IVB cervical cancer patients was significantly shorter than stage IIIB.<sup>14</sup> Other study also suggested that stage IVB cervical cancer patients had a worse prognosis.<sup>15</sup> This worsening prognosis is related to the presence of metastases of cancer cells to the inguinal lymph nodes.

This study showed that SCC had lower survival rate percentage than ADC. This result is different from previous studies which stated that ADC had a worse prognosis than SCC.<sup>16-18</sup> Previous study also found that the average survival rate for patients with SCC was greater (276.6 months) than ADC (243.8 months).<sup>17</sup> Hematogenous metastases occur more frequently in ADC, while in SCC locoregional and lymph node metastases occur more frequently. Patients with hematogenous metastases have a lower survival rate.<sup>18</sup> In addition, patients with ADC tend to be diagnosed at an advanced stage, which can worsen the prognosis.<sup>16</sup>

However, other studies reported similar results to this study in that patients with SCC had lower survival rates than ADC. This difference in results could be caused by the small number of ADC patients in the study, the small number of study samples, and some studies that only used samples of patients in the early stages.<sup>18</sup>

## Conclusions

Based on the results, it can be concluded that the majority of patients were diagnosed at stage IIIB, the majority of patients experienced moderate hydronephrosis, and bilateral hydronephrosis was found in the majority of patients. Then, SCC dominates in cervical cancer patients and has a lower survival rate than ADC. Meanwhile, patients with stage IVB have a lower survival rate than IIIB and IVA. Then, patients with unilateral hydronephrosis have a

lower survival rate than bilateral. Furthermore, patients with severe hydronephrosis had the lowest survival rate among the other two grades and deobstruction in all three degrees had a higher survival rate with either DJ stent, PCN, or UCS insertion.

In the future, anatomical pathology laboratories are advised to complement the results with grading of cancer cell differentiation. Then, in future research, multicenter study needs to be carried out with a larger sample size so that the research results are more representative. Apart from that, research is also needed to look at patient survival rates based on grading of cancer cell differentiation, therapy received, and patient compliance with therapy.

## Conflicts of Interest

The authors declare no conflict of interest.

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