Survival outcomes of patients with cervical cancer and accompanying hydronephrosis: A systematic review of the literature

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Abstract

Hydronephrosis is a sign of advanced stage disease in patients with cervical cancer. Its presence is believed to negatively affect the survival of patients. To date, however, consensus in this field is still lacking. The purpose of the present systematic review is to gather the available data and to provide directions for future research in the field. We systematically searched Medline, Scopus, Clinicaltrials.gov, EMBASE, Cochrane Central Register of Controlled Trials CENTRA and Google Scholar databases from inception till June 2018. Overall, 22 studies were included in the present systematic review that evaluated outcomes from 8521 patients with cervical cancer. The findings of our systematic review support that hydronephrosis negatively affects the overall survival of cervical cancer patients. Specifically, the reported 5-year OS hazards ratio for hydronephrosis ranged between 1.34 and 3.74. Outcomes concerning the disease-free survival of these patients were, however, less discrete. None of the included studies reported whether the decreased survival of patients with hydronephrosis was attributed to complications of obstructive uropathy such as uremia and sepsis. Thus, it remains, to date, unclear whether placement of ureteral stents or percutaneous nephrostomy may actually benefit these patients. More studies are needed to evaluate the actual impact of hydronephrosis on survival rates at the various stages of cervical cancer and to help establish consensus regarding the optimal mode of management of these patients.

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Introduction

Cervical cancer has gained significant attention during the last 30 years. Despite the advances in preventing strategies, which nowadays include the nine-valent vaccine and the introduction of the HPV DNA and mRNA tests along with the liquid phase cytology, its prevalence has reached a plateau that is still difficult to reduce.[1] In developing countries, the incidence of cervical cancer is higher.[2] Previous studies have associated age, smoking, presence of lymph node metastases, tumor histology, and serum squamous cell carcinoma levels with the OS of patients with advanced stage disease.[3-5]

The presence of ureteral obstruction and hydronephrosis is a sign of advanced stage disease as it indicates involvement of the parametria. It may be accompanied by electrolyte disorders and high blood urea nitrogen (BUN) and serum creatinine levels. Uraemia may often complicate these cases and can result in deterioration of the patient's consciousness level and even death if left untreated. Ureteral stenting has been suggested as a potential method that could help alleviate obstructive symptoms and improve renal function; however, a previous study suggested that as the malignancy progresses, patients develop chronic kidney disease stage 4 an require further treatment.[6] When stenting is not feasible, percutaneous nephrostomy has been suggested as an alternative mean to help renal function and seems to be promising as a mean that could help complete radiotherapy and chemotherapy.[7,8] Nevertheless, to date the method that is used to facilitate urinary diversion is highly dependent on physician`s preference as there is an absolute lack of recommendations concerning the management of cancer patients.[9]

Moreover, it remains unclear whether the presence of ureteral obstruction and hydronephrosis significantly alters the overall survival of patients with advanced stage cervical cancer. At 1988 Sinistrero et al where the first to investigate survival of patients that were treated with radiotherapy and observed that women with stage T3b cervical cancer (17 patients) and hydronephrosis had lower 5-year survival rates compared to those without hydronephrosis (26% *vs* 41%).[10] Since then, a significant number of studies have been published in this field. However, despite the fact that hydronephrosis is unanimously considered as a sign that is associated with compromised survival, there is still lack of consensus concerning the management of these patients. The purpose

of the present systematic review is to accumulate evidence related to the survival of patients with cervical cancer that have developed hydronephrosis and to provide directions for future research concerning their management.

Materials and methods

The present systematic review was designed according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.[11]

Information sources and search methods

We used the Medline (1966-2018), Scopus (2004-2018), Clinicaltrials.gov (2008-2018), EMBASE (1980-2018), Cochrane Central Register of Controlled Trials CENTRAL (1999-2018) and Google Scholar (2004-2018) databases in our primary search along with the reference lists of electronically retrieved full-text papers. The date of our last search was set at September 30th 2018. Our search strategy included the text words *hydronephrosis; ureteral dilatation; cervical cancer; cervical carcinoma* and is schematically presented in the PRISMA flow diagram (Figure 1).

The studies were selected in three consecutive stages. Following deduplication, the titles and abstracts of all electronic articles were screened by two authors (I.B. and G.D.) to assess their eligibility. The decision for inclusion of studies in the present systematic review was taken after retrieving and reviewing the full text of articles that considered as potentially eligible. Potential discrepancies in this latter stage were resolved by the consensus of all authors.

Study selection

Types of studies and patients

The eligibility criteria for the inclusion of studies were predetermined. No language restrictions were applied. All observational studies as well as randomized trials that evaluated the impact of hydronephrosis on survival of patients with cervical cancer were included in the present systematic review. Patients at any stage of the disease where considered as eligible for inclusion as hydronephrosis. Conference abstracts were also considered as eligible and tabulated. Case reports, small case series (<30 cases) as well as experimental animal studies and reviews were not included in the present systematic review.

Investigated outcomes

The 5-year OS rates were predefined as the primary outcome of the present systematic review; whereas OS rates for a time interval that was shorter were defined as a secondary outcome. Disease free survival (DFS) rates and absolute differences in mean survival were also considered as secondary outcomes.

Quality and risk of bias assessment

The risk of bias and methodological quality of the included studies was explored using the Newcastle-Ottawa Scale (NOS), which evaluates the selection of the study groups, the comparability of the groups and the ascertainment of the exposure or outcome of interest.[12]

Results

Overall, 22 studies were included in the present systematic review that evaluated outcomes from 8521 patients with cervical cancer.[10,12-32] The majority of included studies was retrospective and their methodological quality was evaluated as moderate-high based on the Newcastle-Ottawa score (Table 1). Significant heterogeneity was noted in terms of tumor histology, stage of the disease, tumor size, presence of pelvic wall infiltration, lymph node status and implemented treatment (Table 2). The follow-up period of patient ranged significantly as depicted in Table 1, and 5-year overall survival rates were available in 12 studies (Table 3).

Significant differences in terms of overall survival were noted in the majority of included articles as observed in Table 3. The reported 5-year OS hazards ratio for hydronephrosis ranged between 1.34 and 3.74. The severity of hydronephrosis and its impact on overall survival was not evaluated among the included articles, however, Goklu *et al.* observed that the mean survival of patients with unilateral hydronephrosis was significantly larger compared to that of patients with bilateral hydronephrosis (42.2 *vs* 29.9 months).[18] Patel et al reported that the most prominent symptom of hydronephrosis was urinary tract infection (9 out of 17 patients), accompanied by pain (8 out of 17 patients).[17] In their series they observed that 7 patients developed renal failure with creatinine levels that ranged between 1.7 and 5.6 mg/dL. None of the included studies reported, however, whether the decreased survival of patients with hydronephrosis was attributed to complications of obstructive uropathy such as uremia and sepsis.

Discussion

The findings of our systematic review support that hydronephrosis negatively affects the overall survival of cervical cancer patients. The statistical significance is more prominent when 5-year overall survival rates are investigated, as differences in terms of DFS rates are less obvious. On the other hand it remains, to date, unclear whether the survival of these patients is primarily affected by the presence of hydronephrosis as none of the included studies reported whether the survival rates were affected by the presence of acute renal failure and uremia. Moreover, the actual impact of the stage of the disease is a variable that may significantly contribute to the significant heterogeneity in outcomes that were reported in time intervals that were shorter than 5-years

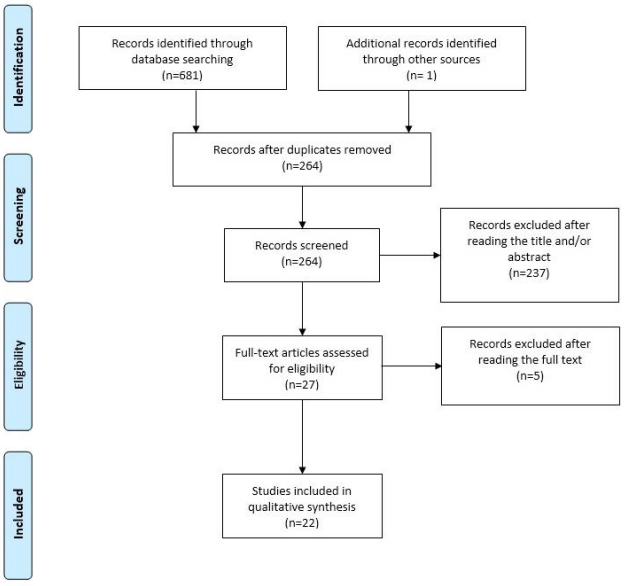

Figure 1. Search strategy.

as patients with advanced stage disease are generally expected to have a short OS. At 2015 et al Patel et al reported that the presence of hydronephrosis is an ominous sign that predicts poor 3-year survival rates and that this effect is evident irrespective of the landmark time point that it is diagnosed.[28]

A significant aspect that also remains poorly investigated, to date, is whether treatment of hydronephrosis significantly benefits the OS of these patients. At 2005 Wilson et al observed that patients with an underlying gynaecological malignancy where more likely to benefit from percutaneous nephrostomy when ureteric obstruction was observed, compared to patients with primary bladder cancer.[33] To date, the actual overall survival of patients with malignant obstructive uropathy remains extremely limited in patients with gynecological malignancy. At 2006, Radecka et al observed that the median survival of oncological patients (regardless of the underlying primary site of the disease) was 255 days when percutaneous nephrostomy was selected as a treatment optio.[34] Dienstmann *et al.* investigated the impact of the procedure in 50 patients with recurrent cervical cancer and observed that 60% had an improvement of their renal function and a median decrease of creatinine that reached 2.7 mg/dL (from 6.4 pre-procedure to 3.7 mg/dL post-procedure).[35] Twenty-nine patients (58%) died from renal failure and the median survival was 8.9 weeks. Current evidence remains compelling concerning the optimal route of urinary diversion in patients with malignant ureteral obstruction of gynecological origin as evidence in this field is extremely limited and mainly relies in population with malignant disease of various origin. In a retrospective analysis of patients with extrinsic ureteral obstruction due to advanced malignancy, Ku *et al.* observed that the possibility of failed diversion was higher when ureteral stenting was performed compared to percutaneous nephrostomy.[36] For this reason, they suggested that patients should be carefully monitored, particularly when ureteral stenting is planned. On the other hand, complications of percutaneous nephrostomy seem to be high as the rates of urinary tract infections range between 20 and 50% and of postoperative ureteral obstruction due to advancing disease of catheter dislodgement between 10 and 40%.[8,25,37-39] Nevertheless, in their majority they seem to be of mild to moderate severity and; thus, do not affect the quality of life of patients. However, since 1996, Emmert *et al*. suggested that patients with terminal cervical cancer cannot be served satisfactorily by nephrostomy.[40] Gadducci *et al*. also suggested that the technique has little to offer to patients with recurrent disease; whereas patients with primary disease may be alleviated until definitive treatment with chemo- and radiotherapy is completed.[41] Recently van Aardt confirmed this hypothesis as they also

Table 1. Study characteristics.

Year; Author	Type of study	NOS score	Patient number	Exclusion criteria	Follow-up (months)
2017; Hata	Retrospective	6	28	Stage other than IVA	45 (3-116)
2017; Ruiz	Retrospective	6	449	Age >35 years, not available medical history, no pathologic confirmation, pre-invasive lesions	45
2016; Murakami	Retrospective	7	209	Distant metastasis other than para-aortic lymph node, follow-up <24 months	32 (27-67.2)
2016; Wakatsuki	Retrospective	6	67	Stage other than IVA, para-aortic lymph nodes ≥1 cm	19 (2-235)
2015; Patel	Retrospective	7	279	NR	18 (0.24-64.8)
2015; Goklu	Retrospective	7	165	Stage <IIIB, surgical treatment, no regular follow-up	NR
2015; Kyung	Retrospective	6	157	Stage I, treatment other than surgery and/or CCRT	55 (12-70)
2015; Biewenga	Retrospective	7	295	Stage <IIB, distant metastasis, histologic type other than squamous, adenosquamous and adenocarcinoma	61 (17-136)
2014; Frumovitz	Retrospective	7	3086	Stage <IB, metastatic disease, cervical melanoma/sarcoma/lymphoma	133 (0-366)
2013; Pinn-Bingham	Retrospective	6	116	Distant metastasis	35.1 (3.8-138.6)
2013; Murakami	Retrospective	6	34	Stage other than IVA, para-aortic lymph node metastasis, surgery, palliative radiation <50 Gy	50.9 (35.7-191)
2012; Pérez-Regadera	Retrospective	5	119	Stage other than IIIB-IVA	46.41 (1-143)
2011; Pradhan	Retrospective	7	197	Stage <IIIB, not available hydronephrosis status	NR
2011; Lapitan	Prospective	7	205	Age <18 years, stage other than IIB-IVA, absence of obstructive uropathy, history of supravesicular urinary diversion	12
2010; Rose	Retrospective	7	539	Stage other than IIIB, serum creatinine >2 mg/dL	NR
2010; Tseng	Prospective	8	251	Stage <IIB, distant metastasis, adenocarcinoma/adenosquamous carcinoma histologic types	75.6
2006; Ogino	Retrospective	7	352	Stage <IIB, distant metastasis, adenocarcinoma/adenosquamous carcinoma histologic types	53 (2-191)
1999; Garipagaoglu	Retrospective	6	166	Stage <IIB or > III	35 (3-119)
1999; Logsdon	Retrospective	6	1096	Stage other than IIIB, history of prior hysterectomy or supracervical hysterectomy, recurrent disease, adenocarcinoma/adenosquamous carcinoma histologic types	134 (2-386)
1998; Chao	Retrospective	7	297	Stage other than IIIB	156
1996; Sardi	Prospective	7	155	Stage other than IIIB, adenocarcinoma/adenosquamous carcinoma histologic types	69.5 (15.4-131.4)
1988; Sinistrero	Retrospective	6	259	Treatment other than radiation	106.8 (30-174)

NR, not reported; NOS, Newcastle-Ottawa score.

Table 2. Patient characteristics.

Year; Author	Age (years)	Histology	Tumor size (cm)	Pelvic wall infiltration	Lymph node status	Stage	Treatment
			Hydronephrosis vs Control				
2017; Hata	72 (29–92)	Squamous: 25 (89%) Adeno: 3 (11%)	6.1 (4.5–11.0)	Unilateral: 13 (46%) Bilateral: 13 (46%)	Pelvic: 12 (42.9%)	IVA	Radiation
2017; Ruiz	32±3.4	Squamous: 388 (84.9%) Adeno: 50 (11%) Adenosquamous: 11 (2.4%)	4.98	NR	Pelvic: 44 (9.7%) PAN: 18 (4%)	I: 94 (20.9%) II: 219 (48.7%) III: 118 (26.2%) IV: 15 (3.3%)	Surgery: 65 (14.5%) CCRT: 191 (42.5%) Radiation: 120 (26.9%) None: 56 (12.5%)
2016; Murakami	62 (42-82)	Squamous: 16 (80%) Adeno: 3 (15%) Adenosquamous: 1 (5%)	7 (4-14)	NR	13 (65%) IVB: 7 (35%)	IIIA: 2 (10%) IIIB: 10 (50%) IVA: 1 (5%)	CCRT: 17 (85%) Radiation: 3 (15%)
2016; Wakatsuki	70 (38–87)	Squamous: 61 (91%) Adeno: 6 (9%)	≤6: 22 (32.8%) >6: 45 (67.2%)	59 (88.1%)	Pelvic: 27 (40.3%)	IVA	CCRT: 11 (16.4%) Radiation: 56 (83.6%)
2015; Patel	54 (25-82) *vs* 47 (21-92)	Squamous: 47 (72%) *vs* 122 (58) Adeno: 10 (15%) *vs* 67 (32%) Other: 8 (12%) *vs* 23 (11%)	NR	NR	NR	I: 21 (32%) *vs* 132 (63%) II: 9 (14%) *vs* 37 (18%) III: 18 (28%) *vs* 21 (10%) IV: 17 (26%) *vs* 21 (10%)	Surgery: 30 (46%) *vs* 139 (65%) Chemotherapy: 45 (69%) *vs* 94 (44%) Radiation: 48 (74%) *vs* 3 (1%)
2015; Goklu	≥65: 128 (77.6%) <65: 37 (22.4%)	Adeno: 81 (49.1%) Adenosquamous: 6 (3.6%)	NR	Unilateral: 74 (44.8%) Bilateral: 74 (44.8%)	NR	III: 131 (79.4%) IVA: 16 (9.7%) IVB: 18 (10.9%)	Chemotherapy: 127 (77%) Radiation: 158 (95.8%)
2015; Kyung	56 (27–85)	Squamous: 124 (79%) Adeno/adenosquamous: 18 (11.5%) Small cell: 15 (9.5%)	≤4: 61 (40.4%) 4-6: 60 (39.7%) >6: 30 (19.9%)	NR	Pelvic: 65 (43.9%) PAN: 8 (5.4%)	IIA: 55 (35.2%) IIB: 60 (38.5%) III: 17 (10.9%) IV: 24 (15.4%)	CCRT: 76 (60.8%) Surgery + Chemotherapy: 26 (20.8%) Surgery + CCRT: 23 (18.4%)
2015; Biewenga	60 (32-83)	Squamous: 255 (86%) Adeno: 28 (10%) Adenosquamous: 12 (45)	5.0 (2.0-9.0)	105 (36%)	Pelvic: 86 (29%) Pelvic + PAN: 37 (13%)	IIB: 152 (51%) IIIA: 14 (5%) IIIB: 109 (37%) IVA: 20 (7%)	Radiation: 94 (32%) CCRT: 97 (33%) CCRT + hyperthermia: 32 (11%) Radiation + hyperthermia: 66 (22%) Surgery + chemotherapy: 6 (2%)
2014; Frumovitz	45 (13-96)	Squamous: 2400 (77.8%) Adeno: 588 (19%) Other: 98 (3.2%)	NR	NR	652 (21.1%)	IB: 1999 (64.8%) II: 603 (19.6%) III: 451(14.6%) IVA: 32 (1%)	Surgery: 468 (15.1%) Radiation: 2281 (74%) Surgery + radiation: 337 (10.9%)
2013; Pinn-Bingham	55 (20-89)	Squamous: 99 (85.3%) Adeno: 7 (6%) Adenosquamous: 7 (6%) Other: 3 (2.7%)	≤6: 66 (58%) >6: 47 (42%)	Unilateral: 20 (17.2%) Bilateral: 15 (12.9%)	NR	IB: 10 (8.6%) II: 48 (41.4%) IIIA: 7 (6%) IIIB: 44 (38%) IVA: 7 (6%)	CCRT: 61 (52.6%) Radiation: 55 (47.4%)
2013; Murakami	62 (32-80)	Squamous: 32 (94.1%) Adeno: 2 (5.9%)	6.7 (3.9-10)	34 (100%)	Pelvic: 12 (35.3%)	IVA	CCRT: 17 (50%) Radiation: 17 (50%)
2012; Pérez-Regadera	NR	NR	NR	NR	NR	NR	CCRT

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Table 2.Continued from previous page..

Year; Author	Age (years)	Histology	Tumor size (cm)	Pelvic wall infiltration *Hydronephrosis vs Control*	Lymph node status	Stage	Treatment
2011; Pradhan	56.2±14 *vs* 59±13.3	Squamous: 64 (91.4%) *vs* 66 (90.4%) Adeno: 2 (2.9%) *vs* 5 (6.9%) Other: 4 (5.7%) *vs* 2 (2.7%)	NR	Unilateral: 25 (35.7%) *vs* 46 (73%) Bilateral: 33 (47.1%) *vs* 20 (27.4%)	Pelvic: 6 (8.6%) *vs* 9 (12.3%) PAN: 16 (22.9%) *vs* 10 (13.7%) Other: 5 (7.1%) *vs* 5 (6.8%)	IIIB: 49 (70%) *vs* 61 (83.6%) IVA: 14 (20%) *vs* 7 (9.6%) IVB: 7 (10%) *vs* 5 (6.8%)	CCRT: 116 (81.1%) Chemotherapy: 7 (4.9%) Radiation: 17 (11.9%)
2011; Lapitan	48.2 (26-71)	NR	NR	NR	NR	IIIB-IVA	NR
2010; Rose	NR	Squamous: 223 (93.7%) *vs* 277 (92%) Adeno: 5 (2.1%) *vs* 10 (3.3%) Adenosquamous: 9 (3.8%) *vs* 12 (4%)	≤2: 0 *vs* 2 (0.7%) 2-6: 94 (39.5%) *vs* 127 (42.2%) 6-10: 129 (54.2%) *vs* 152 (50.5%) ≥10: 13 (5.5%) *vs* 17 (5.6%)	NR	34 (14.3%) *vs* 43 (14.3%)	IIIB	CCRT
2010; Tseng	48.6±9.3	Squamous	≤4: 49 (19.5%) >4: 202 (80.5%)	NR	Pelvic: 71 (28.3%) PAN: 38 (15.1%)	IIB: 133 (52.9%) IIIA: 19 (7.6%) IIIB: 75 (29.8%) IVA: 24 (9.5%)	CCRT
2006; Ogino	61 (28-90)	Squamous	NR	NR	66 (19%)	IIB: 99 (28%) III: 239 (68%) IVA: 14 (4%)	Radiation
1999; Garipagaoglu	52.5 (30-82)	Squamous: 153 (92.2%) Adeno: 8 (4.8%) Other: 5 (3%)	NR	Unilateral: 36 (70%) Bilateral: 16 (30%)	NR	IIB: 114 (68.7%) IIIB: 52 (31.3%)	Radiation
1999; Logsdon	54 (19-99)	Squamous	≤6: 35 (8.5%) 6-8: 97 (23.4%) ≥8: 282 (68.1%)	Unilateral: 436 (40%) Bilateral: 331 (30%)	Pelvis: 189 (32%) PAN: 42 (7%)	IIIB	CCRT: 241 (24.5%) Radiation: 742 (75.5%)
1998; Chao	NR	NR	NR	281 (94.6%)	NR	IIIB	Radiation
1996; Sardi	48	Squamous	NR	Bilateral: 59 (36.6%)	NR	IIIB	Radiation (33.5%) Neoadjuvant chemotherapy + radiation: 54 (33.5%) Surgery + chemotherapy + radiation: 53 (33%)
1988; Sinistrero	60 (18-88)	Squamous: 243 (93.8%) Adeno: 9 (3.5%) Undifferentiated: 4 (1.5%) Clear cell: 3 (1.2%)	NR	NR	NR	T1a: 7 (2.7%) T1b: 30 (11.6%) T2a: 28 (10.8%) T3a: 98 (37.8%) T3b: 8 (3.1%) T4a: 73 (28.2%) T4b: 15 (5.8%)	Radiation

NR, not reported; PAN, para-aortic lymph node; CCRT, concurrent chemoradiation therapy.

Table 3. Reported outcomes.

Year; author	Outcome measure	Statistical test	Outcome
2017; Hata	3-year DFS 3-year OS	Chi-square P-value Chi-square P-value	*P*=0.127 *P*=0.026
2017; Ruiz	5-year OS	Hazard ratio	HR: 1.6 (95%CI 1.0, 4.0)
2016; Murakami	Disease relapse	Chi-square P-value	*P*=0.032
2016; Wakatsuki	2-year DFS	Chi-square P-value	*P*=0.033
2015; Patel	3-year OS	Hazard ratio	4.00 (1.75, 8.01)
2015; Goklu	Mean survival	Mean (95% CI)	71.5 (58.2, 84.8) vs 42.2 (32.1, 52.3) vs 29.9 9 (21.8, 38.1)*
2015; Kyung	5-year OS	Hazard ratio	3.740 (95% CI, 1.843, 7.589)
2015; Biewenga	5-year OS	Hazard ratio	2.1 (95% CI, 1.5, 3.0)
2014; Frumovitz	5-year DSS	Hazard ratio	1.34 (95% CI, 1.22, 1.73)
2013; Pinn-Bingham	3-year OS 5-year OS	Mean (95% CI) Mean (95% CI) Hazard ratio for OS/DFS	68% (46.3-83.0) vs 66% (51.0-77.6) 46% (10.0-76.5) vs 0% (40.4-74.3) 1.65 (0.878-3.114) / 1.27 (0.571-2.806)
2013; Murakami	3-year OS/DFS	Chi-square P-value	*P*=0.091 / *P*=0.201
2012; Pérez-Regadera	5-year OS/DFS	Chi-square	66.02% vs 42.94% / 68.95 vs 46.89
2011; Pradhan	OS	Hazard ratio	2.4 (95% CI, 1.5, 3.8)
2011; Lapitan	12-month OS	Hazard ratio	3.26 (95% CI, 1.51, 7.01)
2010; Rose	Median OS Median DFS	Mean (95% CI) Mean (95% CI)	69.5% (39.5, 93.5) vs 31.5 (22.5, 40.4) 46.6% (23.7, 73.8) vs 17.0 (13.9, 26.9)
2010; Tseng	5-year OS	Multivariate Hazard ratio	2.82 (1.89, 4.67)
2006; Ogino	5-year DFS	Chi-square P-value	*P*<0.001
1999; Garipagaoglu	2-/5-year survival rates	Chi-square P-value	*P*=0.08 / *P*=0.21
1999; Logsdon	5-year DSS	Chi-square P-value	*P*=0.6
1998; Chao	5-year DFS	Wilcoxon log rank P-value	*P*=0.27
1988; Sinistrero	5-year OS	Chi-square P-value	*P*=0.2

DSS, disease specific survival; *Survival compared among patients without hydronephrosis and those with unilateral, bilateral hydronephrosis.

observed that nephrostomy may benefit patients with uremia and primary untreated locally advanced disease, as it may restore blood urea nitrogen levels to normal and; thus, permit the implementation of chemotherapy and radiotherapy that may prolong the survival of these patients.[8] Taking this latter information into account it seems obvious that more information is needed to clarify if obstructive uropathy has the same impact among patients with stage IIb, III and IVa cervical cancer. To date, it is well known that these subgroups of patients have different 5-year survival outcomes and it would be of significant benefit if research would effectively designate whether this is primarily the result of obstructive uropathy, which is generally expected to be more prevalent in patients with stage ≥III disease. Moreover, future studies should investigate the actual impact of hydronephrosis in survival outcomes of patients with recurrent disease and determine if this differ compared to survival rates of patients with primary disease.

Conclusions

The presence of hydronephrosis in cervical cancer patients is a negative sign that predicts poor overall survival. However, to date, it remains unclear, whether treatment of the obstruction may benefit these patients. Limited data support that nephrostomy may restore blood urea nitrogen levels and permit the implementation of chemoradiotherapy, however, further studies are needed in this field to help establish consensuses regarding the optimal mode of treatment of these patients.

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