International Journal of Clinical Urology
2026, Vol. 10, No. 1, pp. 77–84
https://doi.org/10.11648/j.ijcu.20261001.24

Research Article

Progressive Urological Complications of Advanced Gynecological Cancers in Guinea: Epidemiological, Clinical and Therapeutic Aspects

Mamadou Diawo Bah[1, *], Alexandre Vahina Gamamou[1], Daouda Kant é[1], Mamadou Abdoulahayo Sina[1], Aboubacar Cherif[1], Lahoumbo Ricardo Gnammi[1], R émy Fran çois Ako ïGuilavogui[3], Ma ïmouna Bald é[2], Thierno Mamadou Oury Diallo[1], Abdoulaye Bobo Diallo[1], Oumar Raphiou Bah[1], Telly Sy[2]

[1]Urology Department, Ignace Deen University Hospital, Conakry, Guinea

[2]Department of Gynecology and Obstetrics, Ignace Deen University Hospital, Conakry, Guinea

[3]Urology Department, AK Eramishantsev Municipal Clinical Hospital, Moscow, Russia

Abstract

Introduction: Progressive urological complications represent a urological emergency and an unfavorable prognostic factor in advanced gynecological cancers. This study aimed to describe the epidemiological, clinical, therapeutic, and evolutionary aspects of these complications at the Ignace Deen University Hospital in Conakry. *Methodology:* Prospective cross-sectional descriptive study conducted in the urology department of Ignace Deen University Hospital over 2 years (January 2024-December 2025). This study included patients with gynecological cancer presenting progressive urological complications. Variables studied were demographic (age, parity), clinical (histological type, FIGO stage, ECOG performance status), paraclinical (serum creatinine, hemoglobin, ultrasound), therapeutic (urinary drainage, oncological treatments), and evolutionary. Upper urinary tract drainage was performed by percutaneous nephrostomy or JJ stent placement. *Results:* We recorded 88 patients who presented with gynecological cancer with progressive urological complications. The mean age of patients was 54.3 ±11.5 years. Cervical cancer represented 96.6% (squamous cell carcinomas), predominantly at stage IIIB (61.2%). The general condition of patients was severely deteriorated: 59.1% ECOG III and 40.9% ECOG IV. Isolated bilateral ureterohydronephrosis constituted the main complication (47.7%). JJ stent drainage was successful in 55.7% of patients, percutaneous nephrostomy in 22.7%, with a failure rate of 21.6%. Mean serum creatinine decreased from 10.1 to 6.5 mg/dl (36% reduction), hemoglobin increased from 6.9 to 10.0 g/dl. Exclusive palliative care was provided to 73.9% of patients, 21.6% received chemotherapy. Mean hospital stay was 6.2 days with in-hospital mortality of 11.4%. *Conclusion:* This study reveals that urological complications of gynecological cancers in Guinea are characterized by late diagnosis and limited therapeutic options. Despite the feasibility of urinary drainage, the massive recourse to palliative care underscores the poor prognosis. Priorities include HPV vaccination, early screening, strengthening of technical facilities, and development of appropriate palliative care structures.

*Correspondence: Mamadou Diawo Bah (oumarbobo1975@gmail.com)

Received: 1 February 2026; **Accepted:** 12 February 2026; **Published:** 14 April 2026

Keywords

Gynecological Cancers, Guinea, Nephrostomy, JJ Stent, Ureterohydronephrosis

1. Introduction

Gynecological cancers remain a major public health problem worldwide, with particularly high incidence and mortality rates in developing countries [1]. In sub-Saharan Africa, cervical cancer is the leading cause of cancer death among women, with over 111,000 new cases diagnosed in 2018 [2]. Guinea, like many West African countries, faces this alarming reality, where 85% of gynecological cancers are diagnosed at advanced stages, significantly limiting treatment options and worsening the prognosis [3].

One of the most serious consequences of the local progression of gynecological cancers, particularly cervical and ovarian cancer, is urinary tract involvement. Due to the anatomical proximity of the pelvic organs, tumor extension can lead to compression or infiltration of the ureters, resulting in ureteral obstruction and the development of ureterohydronephrosis. This complication occurs in 14% to 44% of patients with advanced cervical cancer and is a major adverse prognostic factor [4, 5].

This complication therefore represents not only a urological emergency requiring rapid drainage to preserve renal function, but also an independent prognostic indicator of mortality [6].

The management of urological complications of advanced gynecological cancers relies primarily on upper urinary tract drainage procedures [7]. These interventions aim to rapidly restore renal function, stabilize the patient's overall condition, and, when possible, allow for the initiation of cancer treatment. However, the success rate of these procedures varies considerably depending on the clinical context, with frequent failures [8].

In the Guinean context, characterized by limited resources, often delayed diagnosis, and restricted technical facilities, the management of these urological complications represents a daily therapeutic challenge. Local data on this issue remain scarce, even though documenting them is essential for optimizing management strategies and improving patient outcomes.

The objective of this study was to describe the epidemiological, clinical, paraclinical, therapeutic and evolutionary aspects of urological complications of gynecological cancers at the Ignace Deen University Hospital Center (UHC) in Conakry.

2. Methodology

2.1. Study Design and Framework

This was a prospective cross-sectional descriptive study conducted in the urology department of the Ignace Deen University Hospital in Conakry over a period of 2 years, from January 2024 to December 2025. The study included all patients with an evolving urological complication of gynecological cancer.

2.2. Study Population and Selection Criteria

We included in our study patients with cervical and/or ovarian cancer and ongoing urological complications who had given their informed consent to participate. We excluded patients with urological complications unrelated to gynecological cancers, those with iatrogenic urological complications related to cancer treatments, and those who declined to participate in the study.

2.3. Sample Size

This was an exhaustive sample including all consecutive patients meeting the inclusion criteria during the 24-month study period. No prior sample size calculation was performed.

2.4. Data Collection and Variables Studied

Recruitment was conducted prospectively and consecutively through urology consultations, the emergency department, and in collaboration with the oncological surgery and gynecology departments. Data were collected using a standardized form and entered into SPSS version 20.0®.

2.5. Variables Studied

The variables studied were age and parity (stratified as nulliparity, primiparity, pauciparity [2-3 deliveries], and multiparity [≥4 deliveries]), histological type, FIGO stage, ECOG performance status, urological complications and comorbidities, serum creatinine (mg/dL), hemoglobin (g/dL), renal ultrasound, and abdominopelvic CT scan. Hydronephrosis was graded from 1 to 4 (grade 1: mild renal pelvic dilatation; grade 2: moderate renal pelvic dilatation without parenchymal thinning; grade 3: severe dilatation with moderate thinning; grade 4: major dilatation with marked thinning), urinary diversion methods (JJ stent and percutaneous nephrostomy [PCN]), and success rates. NPCs were performed under ultrasound guidance with 10-12 Fr probes. JJ stents (6 Fr) were inserted retrogradely without fluoroscopy; in case of failure, NPC was

offered. Oncological treatments (chemotherapy, radiotherapy), palliative care, supportive treatments (hemodialysis, transfusion), and additional surgical procedures were documented.

Evolving variables: length of hospitalization, evolution of creatinine and hemoglobin between admission and discharge, hospital outcome (survival/death).

2.6. Statistical Analysis

This analysis was performed using SPSS 20.0®. Quantitative variables were expressed as means ± standard deviations or medians with interquartile ranges; qualitative variables as counts and percentages. The results were presented in tables and figures and then compared with data from the literature.

2.7. Ethics

This study was approved by the Ethics Committee of the Ignace Deen University Hospital (Ref: 138/CUA/2024). The study was conducted in accordance with the principles of the Declaration of Helsinki. Written informed consent was obtained from all patients before their inclusion in the study, after a detailed explanation of the objectives, procedures, risks, and potential benefits. Data confidentiality and anonymization were guaranteed throughout the study. Patients were free to withdraw from the study at any time without this affecting their medical care.

2.8. Managing Missing Data

All variables of interest were recorded for all patients included in the study, with no missing data.

3. Results

During the 24-month study period (January 2024 to December 2025), 98 patients with gynecological cancer and suspected progressive urological complications were evaluated for inclusion. Ten of these patients were excluded for the following reasons: urological complications unrelated to gynecological cancers (n = 4), iatrogenic complications related to surgical treatments (n = 3), and refusal to participate in the study (n = 3). Ultimately, 88 patients were included and analyzed, of whom 85 had cervical cancer (96.6%) and 3 had ovarian cancer (3.4%). No included patients were lost to follow-up during hospitalization.

The mean age of the patients was 54.3 ± 11.5 years, with the most frequent age group being 50 to 59 years (33.0%). Patients with few pregnancies constituted the predominant group (39.8%). The majority of patients (52.3%) had no comorbidities. The general condition of our patients was considerably impaired, with 59.1% classified as ECOG III (Table 1).

Cervical cancer accounted for the majority of cases with 85 patients (96.6%) and three cases of ovarian cancer (3.4%) completed the series.

From a histological point of view, all cervical cancers were squamous cell carcinomas and bilateral ovarian cancers were serous carcinomas.

Isolated bilateral ureterohydronephrosis represented 47.7% of cases (Table 2).

Among the 85 patients with cervical cancer, the majority were at stage III B (61.2%) (Table 3).

Ureteral drainage by insertion of a JJ stent was the preferred method, successfully performed in 49 patients (55.7%). The overall drainage success rate was 78.4% (Table 4).

Renal ultrasound allowed for the grading of pyelocaliceal dilatation. The distribution showed: 21.6% mild dilatations (grade 1), 29.5% moderate dilatations (grade 2), 29.5% severe dilatations with parenchymal thinning (grade 3), and 19.3% very severe dilatations with thinned parenchyma (grade 4).

From a biological standpoint, the mean serum creatinine level decreased from 10.1 mg/dL on admission (median 9.8 mg/dL) to 6.5 mg/dL on discharge (median 6.0 mg/dL), representing a reduction of approximately 36%. The mean hemoglobin level also improved, increasing from 6.9 g/dL (median 7.0 g/dL) to 10.0 g/dL (median 10.3 g/dL). The mean length of hospital stay was 6.2 days, with a range from 2 to 17 days (Table 5).

Exclusive palliative care was provided to the vast majority of patients (73.9%). Palliative chemotherapy was offered to 19 patients (21.6%). Three patients (3.4%) required hemodialysis in addition to palliative care. Limited surgical procedures, such as transurethral resection of the bladder (TURB), combined with either palliative care (1.1%) or radiotherapy (1.1%), were performed in two specific cases.

Of the 88 patients included, 78 were discharged alive from the hospital (88.6%). Ten hospital deaths were recorded, representing a hospital mortality rate of 11.4%.

Table 1. *Age groups, parity, comorbidities and ECOG status.*

Features	Effective	Percentage
Age range (years)		
30-39	9	10.2%
40-49	21	23.9%
50-59	29	33.0%

Features	Effective	Percentage
60-69	21	23.9%
70-79	8	9.1%
Parity		
Nulliparous (0)	14	15.9%
Primiparous (1)	17	19.3%
Paucipare (2-3)	35	39.8%
Multiparous (≥4)	22	25.0%
Comorbidities		
None	46	52.3%
HTA	25	28.4%
Diabetes	10	11.4%
Hypertension + Diabetes	7	8.0%
ECOG Status		
ECOG III	52	59.1%
ECOG IV	36	40.9%

Table 2. *Urological Complications.*

Type of complication	Effective	Percentage
Isolated ureterohydronephrosis	42	47.7%
Ureterohydronephrosis + invasion of the meatuses	32	36.4%
Ureterohydronephrosis + secondary bladder tumor	13	14.8%
Ureterohydronephrosis + Vesicovaginal fistula	1	1.1%

Table 3. *Distribution of cervical cancer stages (n=85).*

Stages	Effective	Percentage
Stage III B	52	61.2%
Stage IV A	28	32.9%
Stage IV B	5	5.9%

Table 4. *Type of upper urinary tract drainage.*

Drainage method	Effective	Percentage
Bilateral JJ stent insertion	49	55.7%
Unilateral percutaneous nephrostomy	20	22.7%
Drainage failure	19	21.6%

Table 5. *Biological and hospital data.*

Settings	Average	Median	Min - Max
Initial serum creatinine (mg/dl)	10.1	9.8	2.0 - 17.5
Serum creatinine level (mg/dl)	6.5	6.0	1.9 - 16.2
Entry hemoglobin (g/dl)	6.9	7.0	3.0 - 11.2
Excreted hemoglobin (g/dl)	10.0	10.3	6.5 - 13.0
Length of hospital stay (days)	6.2	5.0	2 - 17

4. Discussion

In this prospective study of 88 patients, we described the epidemiological, clinical, paraclinical, and therapeutic aspects of progressive urological complications of gynecological cancers at the Ignace Deen University Hospital in Conakry. This series constitutes one of the first Guinean studies specifically dedicated to this issue, providing essential local data to improve the understanding and management of these serious complications.

Our study has several methodological strengths, including its prospective nature, which ensures higher quality data; its focus on a specific clinical problem that is poorly documented in the Guinean context; and the consecutive inclusion of all eligible patients, reducing the risk of selection bias. However, some limitations must be acknowledged: the lack of long-term follow-up; the single-center design, which limits the extrapolation of results; the absence of fluoroscopic monitoring for JJ stent placement; and the impossibility of systematically performing examinations such as pelvic magnetic resonance imaging (MRI).

From an epidemiological and clinical perspective, the mean age of our patients was 54.3 years, comparable to data reported in several African studies where the mean age of patients with advanced gynecological cancers is between 50 and 58 years [1, 2]. This relatively young age range contrasts with observations in developed countries where the peak incidence is generally after 60 years [9]. This difference is explained by lower life expectancy in sub-Saharan Africa, early exposure to risk factors, particularly human papillomavirus (HPV) infection, and late diagnosis [4, 5].

The predominance of cervical cancer in our series is consistent with African epidemiological data [10, 11]. The World Health Organization (WHO) estimates that more than 85% of the global burden of cervical cancer is borne by low- and middle-income countries [12]. Hypertension remained the most frequent comorbidity, an observation consistent with the African literature [13].

The particularly poor general condition of our patients, with 59.1% classified as ECOG III and 40.9% as ECOG IV, reflects the late diagnosis in Guinea, similar to other African contexts where 70 to 90% of gynecological cancers are diagnosed at advanced stages [14, 15]. This situation contrasts sharply with developed countries where screening programs allow for the diagnosis of the majority of cases at early stages [16]. The WHO, in its global strategy for the elimination of cervical cancer as a public health problem [17], has identified three essential pillars: vaccination, screening, and treatment. Several factors explain this diagnostic delay in Guinea, including low public awareness, cultural and religious beliefs, difficulties in accessing care, and the weakness of the health system [18].

Regarding the anatomopathological aspects and observed complications, the distribution of tumor stages in our series, with a majority of FIGO stage III B, reflects the advanced nature of the cancers at the time of diagnosis [11]. Stage III B, according to the FIGO classification, corresponds to tumor extension to the pelvic wall and/or the presence of hydronephrosis or a non-functioning kidney [19]. This definition therefore directly incorporates urological complications as a staging criterion, highlighting the intrinsic link between advanced tumor extension and urinary tract involvement.

The squamous cell carcinoma histology found in all our patients with cervical cancer is consistent with the global literature, which reports that this histological type represents 70 to 80% of cervical cancers [20]. The serous carcinomas of the ovaries observed in our series also correspond to the most frequent histological type of ovarian cancer [21].

Isolated bilateral ureterohydronephrosis accounted for 47.7% of complications in our series, followed by the association of ureterohydronephrosis with invasion of the ureteral orifices. This high frequency of bilateral complications is explained by central tumor extension, which simultaneously affects both ureters in their pelvic segment. Studies have shown that bilateral involvement occurs in 30% to 50% of patients with ureteral obstruction of gynecological neoplastic origin [22, 23].

Regarding therapeutic management, our overall drainage success rate of 78.4% falls within the range reported in the international literature, which varies from 70% to 90% depending on the series and techniques used [24]. Retrograde JJ stent placement was our first-line treatment, with a success rate of 55.7%. This therapeutic strategy is consistent with international recommendations. Chung et al. [8], in their 15-year

experience managing extrinsic ureteral obstruction with ureteral stents, demonstrated that the retrograde approach should be attempted as a first-line treatment due to its less invasive nature, its internal nature avoiding complex external care, and its better impact on patients' quality of life.

The lack of fluoroscopic guidance in our practice constitutes a significant technical limitation. Studies have shown that fluoroscopic guidance improves the success rate of JJ stent placement by 15 to 20% and reduces complications [25]. Percutaneous nephrostomy under ultrasound guidance was our alternative in cases of failed JJ stent placement, successfully performed in 22.7% of patients. The African context of percutaneous nephrostomy was specifically studied by Ahmed et al. [7] in Nigeria, who reported a success rate of 83.3% with ultrasound guidance, demonstrating the feasibility of sophisticated techniques in resource-limited African settings.

Analysis of the results and prognosis reveals that the high proportion of patients receiving exclusively palliative care reflects the very advanced stage at diagnosis and the poor overall condition of our patients. Only 21.6% were able to benefit from palliative chemotherapy, a rate significantly lower than the standards in developed countries where 40 to 60% of patients with advanced cervical cancer receive cancer treatment.

The significant improvement in serum creatinine observed in our series, with an average reduction of 36%, demonstrates the effectiveness of urinary drainage in restoring renal function. This improvement is consistent with data from the literature, which report reductions of 30% to 50% in serum creatinine after effective drainage. However, it is important to note that this biological improvement does not necessarily reflect an improved overall prognosis, as ureteral obstruction in the context of advanced cancer remains a marker of poor prognosis.

The improvement in hemoglobin levels, increasing on average from 6.9 to 10.0 g/dL, resulted primarily from blood transfusions administered as part of supportive care and likely from improved renal function. The severe anemia observed on admission reflected the chronic nature of the disease and chronic bleeding, common complications of advanced gynecological cancers.

The in-hospital mortality rate of 11.4% in our series reflects the severity of our patients' clinical condition. The causes of death were multifactorial, including end-stage renal failure, sepsis, severe malnutrition, and rapid tumor progression. It is important to emphasize that this in-hospital mortality rate only reflects part of the reality, as the majority of patients likely died within weeks or months of discharge.

Looking ahead, the results of our study highlight the urgent need to develop strategies for the prevention and early detection of gynecological cancers in Guinea. Strengthening the technical infrastructure, particularly through the acquisition of fluoroscopy equipment to improve the success rate of drainage procedures, as well as improving access to oncological treatments, are priorities for our institution. Ongoing training for healthcare professionals in urinary drainage techniques and the implementation of standardized multidisciplinary care protocols are essential to optimizing outcomes.

Finally, the development of local clinical research, with long-term follow-up studies to better assess the prognosis and quality of life of these patients, would allow us to adapt our therapeutic strategies to the Guinean context.

5. Conclusion

Our study reveals a concerning reality of urological complications of gynecological cancers in Guinea, characterized by late diagnosis, severely compromised general health of patients, and limited therapeutic options. Despite the technical feasibility of urinary drainage in our setting, the high hospital mortality rate and the predominant reliance on exclusive palliative care reflect a poor prognosis and highlight the major challenges in managing these patients.

The urgent need is for the development of primary prevention strategies through HPV vaccination and early screening adapted to local resources. Strengthening the technical infrastructure, improving access to cancer treatments, providing continuing education for healthcare professionals, and developing palliative care facilities are essential priorities. Only a comprehensive and multidisciplinary approach, integrating prevention, early diagnosis, optimal treatment, and quality palliative care, will significantly reduce the dramatic burden of advanced gynecological cancers in Guinea.

Abbreviations

UHC	University Hospital Center
CT	Computed Tomography
ECOG	Eastern Cooperative Oncology Group
FIGO	International Federation of Gynecology and Obstetrics
HPV	Human Papillomavirus
HTA	Hypertension
JJ	Double-J (Ureteral Stent)
MRI	Magnetic Resonance Imaging
NPC/PCN	Percutaneous Nephrostomy
TURB	Transurethral Resection of the Bladder
WHO	World Health Organization

Acknowledgments

We extend our sincere thanks to our esteemed mentor, Professor Abdoulaye Bobo Diallo, and to our other mentors who supervised this research. We also thank the patients who provided their consent and enabled us to successfully complete this study.

Author Contributions

Mamadou Diawo Bah: Conceptualization, Methodology,

Project administration, Writing – original draft

Alexandre Vahina Gamamou: Conceptualization, Data curation, Formal analysis, Investigation, Supervision, Writing – review & editing

Daouda Kanté: Writing – review & editing

Mamadou Abdoulahayo Sina: Data curation, Formal analysis

Aboubacar Cherif: Data curation, Investigation

Lahoumbo Ricardo Gnammi: Formal analysis, Visualization

Rémy François Akoïa Guilavogui: Formal analysis, Writing – review & editing

Maïmouna Baldé: Writing – review & editing

Thierno Mamadou Oury Diallo: Conceptualization, Methodology, Supervision

Abdoulaye Bobo Diallo: Conceptualization, Supervision, Validation

Oumar Raphiou Bah: Validation, Writing – review & editing

Funding

This work did not receive any specific grant from any public, commercial or non-profit funding body.

Conflicts of Interest

The authors declare that they have no conflict of interest.

References

[1] Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin. 2018; 68(6): 394-424. https://doi.org/10.3322/caac.21492

[2] Arbyn M, Weiderpass E, Bruni L, de Sanjosé S, Saraiya M, Ferlay J, et al. Estimates of incidence and mortality of cervical cancer in 2018: a worldwide analysis. Lancet Global Health. 2020; 8(2): e191-e203. https://doi.org/10.1016/S2214-109X(19)30482-6

[3] Small W Jr, Bacon MA, Bajaj A, Chuang LT, Fisher BJ, Harkenrider MM, et al. Cervical cancer: A global health crisis. Cancer. 2017; 123(13): 2404-2412. https://doi.org/10.1002/cncr.30667

[4] Gebreselassie KH, Adamu TA, Beyene AD. Ureteral stenting in patients with locally advanced cervical cancer: Predictors of low success rate. Gynecol Oncol Rep. 2024 Aug 28; 55: 101491. https://doi.org/10.1016/j.gore.2024.101491

[5] Steevy Ndang Ngou Milama, Adrien Mougougou, Euloge Ibinga, Dimitri Mbethe, Audrey Bikene Bi Ntoutoume, et al. Prognosis of Hydronephrosis in Cervical Cancer at the Libreville Cancer Institute. Int J Clin Urol. 2022; 6(1): 45-50. https://doi.org/10.11648/j.ijcu.20220601.21

[6] Denny L, Quinn M, Sankaranarayanan R. Screening for cervical cancer in developing countries. Vaccinated. 2006; 24 Suppl 3: S3/71-77. https://doi.org/10.1016/j.vaccine.2006.05.121

[7] Ahmed M, Lawal AT, Bello A, Sudi A, Awaisu M, Mahomet S, Oyelowo N, Tolani M, Hamza BK, Maitama HY. Ultrasound-guided percutaneous nephrostomy: Experience at Ahmadu Bello Teaching Hospital in Zaria. Nigerian Journal of Clinical Practice. 2017; 20(12): 1622-1625. https://doi.org/10.4103/njcp.njcp_138_17

[8] Chung SY, Stein RJ, Landsittel D, Davies BJ, Cuellar DC, Hrebinko RL, et al. 15-year experience with the management of extrinsic ureteral obstruction with indwelling ureteral stents. J Urol. 2004; 172(2): 592-595. https://doi.org/10.1097/01.ju.0000130510.28768.f5

[9] Torre LA, Islami F, Siegel RL, Ward EM, Jemal A. Global cancer in women: burden and trends. Cancer Epidemiol Biomarkers Prev. 2017; 26(4): 444-457. https://doi.org/10.1158/1055-9965.EPI-16-0858

[10] Parkin DM, Bray F, Ferlay J, Jemal A. Cancer in Africa 2012. Cancer Epidemiol Biomarkers Prev. 2014; 23(6): 953-966. https://doi.org/10.1158/1055-9965.EPI-14-0281

[11] Sankaranarayanan R, Ferlay J. Worldwide burden of gynecological cancer: the size of the problem. Best Pract Res Clin Obstet Gynaecol. 2006; 20(2): 207-225. https://doi.org/10.1016/j.bpobgyn.2005.10.007

[12] World Health Organization. WHO guideline for screening and treatment of cervical pre-cancer lesions for cervical cancer prevention, second edition. Geneva: World Health Organization; 2021.

[13] Ola IO, Okunowo AA, Habeebu MY. Mortality risk stratification based on comorbidity status among cervical cancer patients in Lagos, Nigeria. IntHealth. 2025 Sep 3; 17(5): 669-677. https://doi.org/10.1093/inthealth/ihaf008

[14] Nthambi L, Temmerman M, Macharia WM, Nyagol J, Mogere S, Neary J, Nyabs E, Itindi J, Langat A, Wangari E, Chung MH, Mwenda V, John-Stewart G, Singa B, McGrath CJ. Factors associated with cervical cancer screening among women attending maternal child health clinics in Kenya. BMC Womens Health. 2025 Nov 10; 25(1): 549. https://doi.org/10.1186/s12905-025-04048-9

[15] Denny L. Cervical cancer: prevention and treatment. Discov Med. 2012; 14(75): 125-131.

[16] Saslow D, Solomon D, Lawson HW, Killackey M, Kulasingam SL, Cain J, et al. American Cancer Society, American Society for Colposcopy and Cervical Pathology, and American Society for Clinical Pathology screening guidelines for the prevention and early detection of cervical cancer. CA Cancer J Clin. 2012; 62(3): 147-172. https://doi.org/10.3322/caac.21139

[17] World Health Organization. Global strategy to accelerate the elimination of cervical cancer as a public health problem. Geneva: World Health Organization; 2020.

[18] Dim CC, Ekwe E, Madubuko T, Dim NR, Ezegwui HU. Improved awareness of pap smear may not affect its use in Nigeria: a case study of female medical practitioners in Enugu, southeastern Nigeria. Trans R Soc Trop Med Hyg. 2009; 103(8): 852-854. https://doi.org/10.1016/j.trstmh.2009.02.019

[19] Pecorelli S, Zigliani L, Odicino F. Revised FIGO staging for carcinoma of the cervix. Int J Gynaecol Obstet. 2009; 105(2): 107-108. https://doi.org/10.1016/j.ijgo.2009.02.009

[20] Cohen PA, Jhingran A, Oaknin A, Denny L. Cervical cancer. Lancet. 2019; 393(10167): 169-182. https://doi.org/10.1016/S0140-6736(18)32470-X

[21] Prat J. Ovarian carcinomas: five distinct diseases with different origins, genetic alterations, and clinicopathological features. Virchows Arch. 2012; 460(3): 237-249. https://doi.org/10.1007/s00428-012-1203-5

[22] Ku JH, Lee SW, Jeon HG, Kim HH, Oh SJ. Percutaneous nephrostomy versus indwelling ureteral stents in the management of extrinsic ureteral obstruction in advanced malignancies: are there differences? Urology. 2004; 64(5): 895-899. https://doi.org/10.1016/j.urology.2004.06.013

[23] Lapitan MC, Buckley BS. Impact of palliative urinary diversion by percutaneous nephrostomy drainage and ureteral stenting among patients with advanced cervical cancer and obstructive uropathy: a prospective cohort. J Obstet Gynaecol Res. 2011 Aug; 37(8): 1061-70. https://doi.org/10.1111/j.1447-0756.2010.01486.x

[24] Pavlovic K, Lange D, Chew BH. Stents for malignant ureteral obstruction. Asian J Urol. 2016 Jul; 3(3): 142-149. https://doi.org/10.1016/j.ajur.2016.04.002

[25] Ünal E, Çiftçi TT, Akhan O, Akinci D. Imaging-Guided De Novo Retrograde Ureteral Access and Stent Placement without Cystoscopy in Women. J Vasc Interv Radiol. 2023 May; 34(5): 902-909. https://doi.org/10.1016/j.jvir.2022.12.483