

ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCES
SCHOOL OF MEDICINE
DEPARTMENT OF ONCOLOGY



**CLINICAL CHARACTERISTICS, TREATMENT PATTERNS, AND SURVIVAL OF
VULVAR CANCER: A 5 YEARS STUDY AT A TERTIARY HOSPITAL IN ETHIOPIA**

BY: DR TADIOS TEKA (CLINICAL ONCOLOGY SENIOR RESIDENT)

FINAL THESIS REPORT TO BE SUBMITTED TO DEPARTMENT OF CLINICAL
ONCOLOGY, FACULTY OF MEDICAL SCIENCES, INSTITUTE OF HEALTH, ADDIS
ABABA UNIVERSITY AS PARTIAL FULFILLMENT OF SPECIALITY IN CLINICAL
ONCOLOGY

Clinical characteristics, treatment patterns, and survival of Vulvar cancer: A Five-year study at a tertiary hospital in Ethiopia

By: Dr Tadios Teka (clinical oncology senior resident)

Advisors:

1. Dr Damena Teshome, consultant oncologist, Institute of Health, Addis Ababa University, Addis Ababa, Ethiopia
2. Dr Sonia Worku, consultant oncologist, Institute of Health, Addis Ababa University, Addis Ababa, Ethiopia

DEC 11, 2024

ADDIS ABABA, ETHIOPIA

SUMMARY

Background: - Vulvar cancer is a rare but significant malignancy affecting women's health worldwide, including in Ethiopia. Despite advancements in medical treatment, the survival rate and treatment outcomes for vulvar cancer patients remain varied across different regions and healthcare facilities. This study aimed to investigate the clinical characteristics, treatment patterns and survival outcomes of vulvar cancer patients visited to Tikur Anbesa Specialized Hospital (TASH).

Methods: - A retrospective study was conducted at the Oncology Department of Tikur Anbesa Specialized Hospital (TASH), a tertiary teaching hospital in Addis Ababa, Ethiopia. Electronic medical records of patients managed with vulvar cancer from January 2019 to October 2021 were reviewed. Survival status and any missing data were cross-checked via phone calls with the patients or their family members. Data were collected on socio-demographic characteristics, clinical presentations, diagnostic tests, treatments, and outcomes. Descriptive statistics and Kaplan-Meier survival analysis were used to analyze the data.

Results: A total of 89 patients with vulvar were visited during the five-year study period. The median age was 45 years (IQR: 32–60), and majority patients 32(36.4%) resided in Addis Ababa, and 57 (64%) married. Among the 89 patients with complete medical records, the most common presenting symptoms were Vulvar or groin mass 65(73%) and Vulvar itching 46(51.1%), while vaginal bleeding was observed in 17% of cases. The majority of patients 74(83.1%) had favorable ECOG status but 37(41.6%) had FIGO stage III at presentation. HIV infections were reported positive by 67.4% of patients. Overall, 77.52% were planned for primary intent of radical treatment, but only 41.57% received the planned radical treatment. Chemotherapy was administered to 39 (48.1%) of patients with Radiotherapy and surgical management given for 37.07% and 27% respectively. The overall mortality rate was 34.8%, and factors such as treatment delay (50.6%) and advanced FIGO stage III (67.7%) were common. Patients who are none responders to any of initial therapy had significantly higher risk of mortality ($p < 0.05$), with survival rates dropping to 0% by month 50 in this group.

Conclusions: This study highlights the significant burden of vulvar cancer, characterized by a notably younger age and advanced FIGO stage at presentation with substantial mortality. Enhancing healthcare access, raising awareness, ensuring timely diagnosis, and implementing early intervention strategies are essential for improving outcomes. The findings emphasize the urgent need for robust public health strategies to prevent, manage, and mitigate the impact of vulvar cancer, particularly in low-resource settings such as Ethiopia.

Key words: Vulvar cancer, treatment patterns, gynecological malignancy, oncology, survival, Addis Ababa.

ADVISOR’S APPROVAL SHEET

This is to certify that the thesis entitled “**Clinical characteristics, treatment patterns, and survival of Vulvar cancer: A Five-year study at a tertiary hospital in Ethiopia**” is submitted in partial fulfillment of the requirements for the Specialization Certificate in clinical oncology to the department of clinical oncology, Addis Ababa University college of health science and has been carried out by Dr Tadios Teka under my supervision. Therefore, I recommend that the student has fulfilled the requirements and hence hereby can submit the Thesis to the Department.

Dr Damena Teshome (Consultant Oncologist)

Dr Sonia Worku (Consultant Oncologist)

Name of Major Advisor

Signature

Date

ACKNOWLEDGEMENT

First and foremost, I would like to acknowledge Addis Ababa University, Institute of Health, Faculty of Health sciences and School of Medicine sciences for timely informing me to submit my proposal, evaluating and selecting my research topics as well as assigning cooperative and energetic advisors, Dr Damena Teshome and Dr Sonia Worku to guide me during this proposal development.

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1. INTRODUCTION

1.1 Background

Vulvar cancer is a relatively rare gynecological malignancy, accounting for about 4% of all gynecologic cancers worldwide. It primarily affects older women, with the majority of cases diagnosed in women over the age of 60. The incidence of vulvar cancer has been increasing globally, which is attributed to factors such as the aging population and improved diagnostic capabilities [1]. Despite its rarity, vulvar cancer poses significant challenges in terms of diagnosis, treatment, and management due to its complex anatomy and the need for individualized therapeutic approaches [2].

In Ethiopia, the burden of gynecological cancers is substantial, with limited resources and infrastructure dedicated to their management. Tikur Anbesa Specialized Hospital, one of the largest referral centers in the country, plays a crucial role in providing care for cancer patients, including those with vulvar cancer. However, there is a paucity of data on the specific treatment patterns and survival outcomes of vulvar cancer patients in Ethiopia, highlighting the need for detailed retrospective analyses to inform clinical practice and healthcare policy [3]. Globally, the treatment of vulvar cancer typically involves a combination of surgery, radiotherapy, and chemotherapy, depending on the stage and extent of the disease.

Early-stage vulvar cancer is primarily treated with surgery, which may include wide local excision or radical vulvectomy. In more advanced stages, adjuvant radiotherapy and chemotherapy are often required to achieve better local control and improve survival outcomes [4,5]. The choice of treatment is influenced by various factors, including tumor size, location, patient age, and overall health status [6].

Despite advances in treatment modalities, the survival rate for vulvar cancer varies widely across different regions and healthcare settings. In high-income countries, five-year survival rates for vulvar cancer range from 60% to 70%, while in low- and middle-income countries, these rates are significantly lower [7]. This disparity is often attributed to differences in healthcare infrastructure, availability of specialized care, and timely access to treatment [8]. Previous studies have indicated that the survival outcomes of vulvar cancer patients are significantly influenced by the stage at diagnosis. Early detection and timely intervention are critical for improving prognosis and survival rates. However, in many low-resource settings, late presentation and delayed diagnosis are common, leading to poorer outcomes [9]. This underscores the importance of improving awareness, screening, and early diagnosis of vulvar cancer in Ethiopia.

The treatment patterns for vulvar cancer also vary significantly based on geographic and socioeconomic factors. In high-resource settings, patients have better access to advanced surgical techniques, radiotherapy, and chemotherapy, whereas in low-resource settings, treatment options

may be limited due to financial constraints and lack of specialized care [10]. Understanding these patterns is essential for developing targeted interventions to enhance treatment accessibility and effectiveness in Ethiopia.

Research on vulvar cancer in sub-Saharan Africa, including Ethiopia, is limited, with most studies focusing on cervical cancer, which is more prevalent. Consequently, there is a critical gap in knowledge regarding the epidemiology, treatment, and outcomes of vulvar cancer in this region. Addressing this gap requires comprehensive retrospective studies that can provide valuable insights into the management and survival of vulvar cancer patients [11].

Tikur Anbesa Specialized Hospital, being a leading institution in Ethiopia, has a unique opportunity to contribute to this body of knowledge through systematic data collection and analysis. By examining the treatment patterns and survival outcomes of vulvar cancer patients over the past five years, this study aims to fill the existing knowledge gap and provide evidence-based recommendations for improving care [12].

The findings from this retrospective analysis will not only enhance the understanding of vulvar cancer in Ethiopia but also inform clinical guidelines and policy decisions. Improved knowledge of treatment outcomes can lead to the development of tailored interventions that address the specific needs and challenges faced by vulvar cancer patients in low-resource [13]. Additionally, it can guide resource allocation and capacity-building efforts to strengthen the healthcare system's ability to manage gynecological cancers effectively.

In conclusion, vulvar cancer is a significant yet under-researched public health issue in Ethiopia. This study aims to provide a comprehensive analysis of treatment patterns and survival outcomes for vulvar cancer patients at Tikur Anbesa Specialized Hospital. By doing so, it seeks to contribute to the global understanding of vulvar cancer management and support the development of context-specific strategies to improve patient outcomes in Ethiopia and similar settings [14].

1.2. Statement of the problem

Vulvar cancer, though relatively rare, poses a significant challenge to women's health due to its complex diagnosis and treatment modalities. The incidence of vulvar cancer varies globally, with a rising trend observed in certain regions, possibly due to changes in risk factors such as HPV infection and aging populations [15]. In Ethiopia, data on the incidence and outcomes of vulvar cancer are sparse, and the available statistics likely underestimate the true burden of the disease.

Tikur Anbesa Specialized Hospital, being the largest referral hospital in the country, provides a unique opportunity to analyze treatment patterns and survival outcomes in this patient population. However, there has been limited research focused on vulvar cancer in this setting,

which impedes the development of evidence-based clinical guidelines and optimal patient care strategies [16].

Understanding the treatment patterns and survival rates of vulvar cancer patients at Tikur Anbesa Specialized Hospital is crucial for improving patient outcomes. Treatment for vulvar cancer often involves a combination of surgery, radiotherapy, and chemotherapy, but the choice of treatment is influenced by various factors, including the stage of the disease, patient comorbidities, and resource availability [17].

In resource-limited settings like Ethiopia, these factors may significantly affect treatment choices and, consequently, patient survival. By conducting a 5-year retrospective analysis of vulvar cancer patients at this institution, this study aims to fill the gap in knowledge regarding the clinical management and outcomes of vulvar cancer in Ethiopia. The findings will not only inform clinical practice at Tikur Anbesa but also contribute to the broader understanding of vulvar cancer treatment in similar settings globally [18].

1.3. Significant of the study

The study of treatment patterns and survival in vulvar cancer patients at Tikur Anbesa Specialized Hospital is of paramount importance for several reasons. Firstly, vulvar cancer, though relatively rare, poses a significant health burden on affected women, particularly in resource-limited settings like Ethiopia. Comprehensive data on treatment outcomes and survival rates are essential for understanding the effectiveness of current therapeutic approaches and identifying gaps in patient care. By conducting a five-year retrospective analysis, this study will provide valuable insights into the real-world clinical management of vulvar cancer in Ethiopia, which can guide future healthcare policies and resource allocation [19]. Furthermore, this study will contribute to the global body of knowledge on vulvar cancer by providing data from a low-resource setting, which is often underrepresented in oncology research. Understanding how various factors, such as socio-economic status, comorbidities, and access to healthcare, influence treatment decisions and survival outcomes is crucial for developing tailored interventions that can improve patient prognosis. The findings from this study can also serve as a baseline for future research and clinical trials aimed at optimizing vulvar cancer treatment protocols in Ethiopia and similar settings [20,21].

2. Literature Review

2.1 Epidemiology of Vulvar cancer: Global Burden and Trends

Vulvar cancer is a relatively rare malignancy, accounting for approximately 3-5% of all gynecological cancers worldwide. Despite its rarity, it represents a significant health concern due to its association with high morbidity and mortality rates. The incidence of vulvar cancer varies significantly across different regions and populations. In developed countries, the incidence is relatively low, with rates ranging from 1 to 2 per 100,000 women annually. However, in developing regions, including parts of Africa and Asia, the incidence is higher, reflecting disparities in healthcare access, diagnostic facilities, and public health awareness [22].

Recent epidemiological trends indicate an increase in vulvar cancer incidence among younger women in high-income countries, attributed to the rising prevalence of human papillomavirus (HPV) infections. HPV, particularly HPV-16 and HPV-18, has been identified as a significant etiological factor in vulvar carcinogenesis. Studies have shown that HPV-associated vulvar cancers tend to occur in younger women, whereas non-HPV-related cases are more common in older women and are often linked to chronic inflammatory conditions such as lichen sclerosis [23,24].

In low- and middle-income countries, vulvar cancer remains underreported, and the true burden is likely underestimated due to limited cancer registries and lack of comprehensive epidemiological data. In sub-Saharan Africa, for instance, vulvar cancer incidence is believed to be higher than reported, with many cases going undiagnosed or being misclassified due to inadequate diagnostic infrastructure and cultural barriers to seeking medical care [25]. Moreover, the survival rates in these regions are generally poorer compared to high-income countries, reflecting delays in diagnosis and limited access to appropriate treatment [26].

Efforts to improve vulvar cancer outcomes globally have focused on HPV vaccination and early detection strategies. The introduction of prophylactic HPV vaccines has shown promise in reducing the incidence of HPV-related vulvar cancers. In countries with established HPV vaccination programs, a decline in the prevalence of high-risk HPV types and associated precancerous lesions has been observed, suggesting a potential long-term reduction in vulvar cancer incidence [27,28]. However, the implementation of such programs in low-resource settings faces significant challenges, including vaccine affordability, healthcare infrastructure, and public awareness [29].

In conclusion, vulvar cancer presents a significant public health challenge with distinct epidemiological patterns globally. While high-income countries have seen shifts in incidence trends and improvements in survival rates due to advancements in HPV vaccination and early detection, low- and middle-income countries continue to struggle with underreporting and

limited healthcare resources. Addressing these disparities requires a concerted effort to enhance cancer surveillance, increase access to HPV vaccination, and improve diagnostic and treatment facilities in underserved regions [8].

2.2 Clinical Presentation of Vulvar Cancer Patients

Vulvar cancer is a rare form of gynecological malignancy, accounting for approximately 4% of all gynecological cancers. The clinical presentation of vulvar cancer in adult patients often varies, but the most common initial symptom is pruritus (itching) of the vulva, followed by the presence of a noticeable mass or lesion. These lesions are typically found on the labia majora and are frequently mistaken for benign conditions, which can lead to delays in diagnosis and treatment [30]. Other symptoms include pain, ulceration, bleeding, and dysuria (painful urination). The progression of these symptoms, coupled with the misdiagnosis, underscores the need for increased awareness and timely investigation of vulvar complaints in clinical practice [31].

Histologically, the majority of vulvar cancers are squamous cell carcinomas, accounting for about 90% of cases, while other types such as melanoma, adenocarcinoma, and basal cell carcinoma constitute the remaining 10% [32]. The development of vulvar cancer has been associated with several risk factors, including human papillomavirus (HPV) infection, lichen sclerosis, smoking, and immunosuppression [33]. Early-stage vulvar cancer can often be managed with surgical excision, but advanced stages may require a combination of surgery, radiotherapy, and chemotherapy [34]. The variability in clinical presentation and progression necessitates a tailored approach to diagnosis and treatment, emphasizing the importance of specialized care and thorough clinical evaluation [35].

2.3 Diagnostic Challenges and Strategies in Vulvar Cancer Management

Vulvar cancer remains a significant public health issue globally, characterized by diagnostic challenges and diverse management strategies. Early detection is crucial for improved outcomes, yet disparities in healthcare access and awareness often hinder timely diagnosis. Misdiagnosis is prevalent, with benign conditions frequently mistaken for vulvar cancer, leading to unnecessary treatments and delayed definitive care [36]. Furthermore, limited access to specialized healthcare, particularly in resource-constrained settings, contributes to diagnostic delays and suboptimal management. Addressing these challenges necessitates enhanced awareness campaigns, improved diagnostic capabilities, and the establishment of referral systems to specialized centers.

Despite advancements in vulvar cancer management, optimal treatment approaches remain a subject of ongoing investigation. Surgical resection is the cornerstone of treatment, but the extent of surgery varies widely based on tumor stage, patient factors, and available resources. Adjuvant therapies, including radiotherapy and chemotherapy, play crucial roles in specific

patient subsets. However, evidence regarding the optimal sequencing and duration of these treatments is limited, particularly in low- and middle-income countries. Moreover, the impact of socioeconomic factors and patient-related outcomes on treatment decisions and survival remains understudied [37].

2.4 Etiological Spectrum of Vulvar Cancer: Geographical and Temporal Variations

Vulvar cancer, though a relatively rare malignancy, exhibits distinct etiological patterns that vary both geographically and temporally. Human papillomavirus (HPV) infection is recognized as a significant risk factor for vulvar cancer, with its prevalence and impact showing considerable variation across different regions. In high-income countries, the incidence of HPV-related vulvar cancer has been on the rise, attributed largely to changes in sexual behavior and HPV infection rates.

Conversely, in low- and middle-income countries, including many parts of Africa, the burden of vulvar cancer remains understudied, but is thought to be influenced by a combination of HPV infection, chronic inflammatory conditions, and limited access to healthcare [38,39]. Additionally, socio-economic factors, cultural practices, and genetic predispositions may further contribute to the regional differences observed in the etiological spectrum of this disease [40,8].

Over the past few decades, temporal variations in the incidence and etiology of vulvar cancer have also been documented. Improvements in diagnostic techniques and increased awareness have led to earlier detection and better reporting of cases, particularly in developed regions. Moreover, the introduction of HPV vaccination programs has begun to show a promising reduction in the incidence of HPV-related vulvar cancers among younger cohorts [41,42]. However, these advancements have not been uniformly implemented worldwide, leading to persistent disparities in vulvar cancer outcomes. In Ethiopia, the lack of comprehensive cancer registries and limited access to preventive measures, such as HPV vaccination and screening programs, pose significant challenges in addressing the burden of vulvar cancer [43]. This underscores the need for region-specific research to understand the unique etiological factors and to develop tailored interventions aimed at improving the management and survival of vulvar cancer patients.

Human immunodeficiency virus (HIV) infection and the development of vulvar cancer:

The etiological spectrum of vulvar cancer exhibits notable geographical and temporal variations, with a significant interplay between human immunodeficiency virus (HIV) infection and the development of vulvar cancer in specific regions. In areas with a high prevalence of HIV, such as sub-Saharan Africa, immunosuppression associated with HIV is a critical factor increasing susceptibility to persistent human papillomavirus (HPV) infection, particularly oncogenic strains like HPV-16 and HPV-18, which are strongly implicated in vulvar carcinogenesis. HIV-related

immunodeficiency reduces the clearance of HPV, thereby facilitating progression from low-grade squamous intraepithelial lesions to high-grade lesions and invasive vulvar cancer. Additionally, disparities in access to preventive measures, such as HPV vaccination and regular screening, exacerbate this risk. Temporal shifts in the incidence of vulvar cancer have also been linked to increased HIV prevalence in younger populations, altering traditional age-related patterns of disease onset. This underscores the necessity of integrated HIV and HPV prevention strategies to mitigate the burden of vulvar cancer in endemic regions[44,45].

2.5 Survival and treatment patterns of Vulvar Cancer in Adult Patients

2.5.1 Treatment Patterns of Vulvar Cancer

Treatment for vulvar cancer typically involves a multidisciplinary approach, including surgery, radiotherapy, and chemotherapy, depending on the disease stage and patient condition. Surgical management, particularly radical vulvectomy with or without lymphadenectomy, is the cornerstone of treatment for early-stage disease [46]. For advanced cases, combined modalities including chemoradiation are often utilized to improve outcomes [47].

Despite these strategies, the choice of treatment can be influenced by factors such as tumor characteristics, patient preferences, and healthcare resources [48]. Studies emphasize the importance of individualized treatment plans to optimize outcomes and manage side effects effectively [49]. Regional disparities in treatment patterns reflect variations in healthcare infrastructure and availability of specialized care, which can impact overall treatment efficacy and patient survival [50].

2.5.2 Survival vulvar cancer patients

Vulvar cancer is a rare gynecological malignancy with variable survival outcomes based on stage at diagnosis, treatment modalities, and patient demographics. Studies show that early-stage vulvar cancer patients generally have a favorable prognosis, with 5-year survival rates exceeding 80% for localized cases [51]. However, survival rates decline significantly for those with advanced disease.

For instance, the 5-year survival rate for patients with distant metastasis is often less than 20% [52]. Factors such as age, comorbidities, and access to specialized care also play critical roles in influencing survival outcomes [53]. Research highlights that disparities in survival rates can be linked to variations in healthcare access and treatment quality across different regions [53].

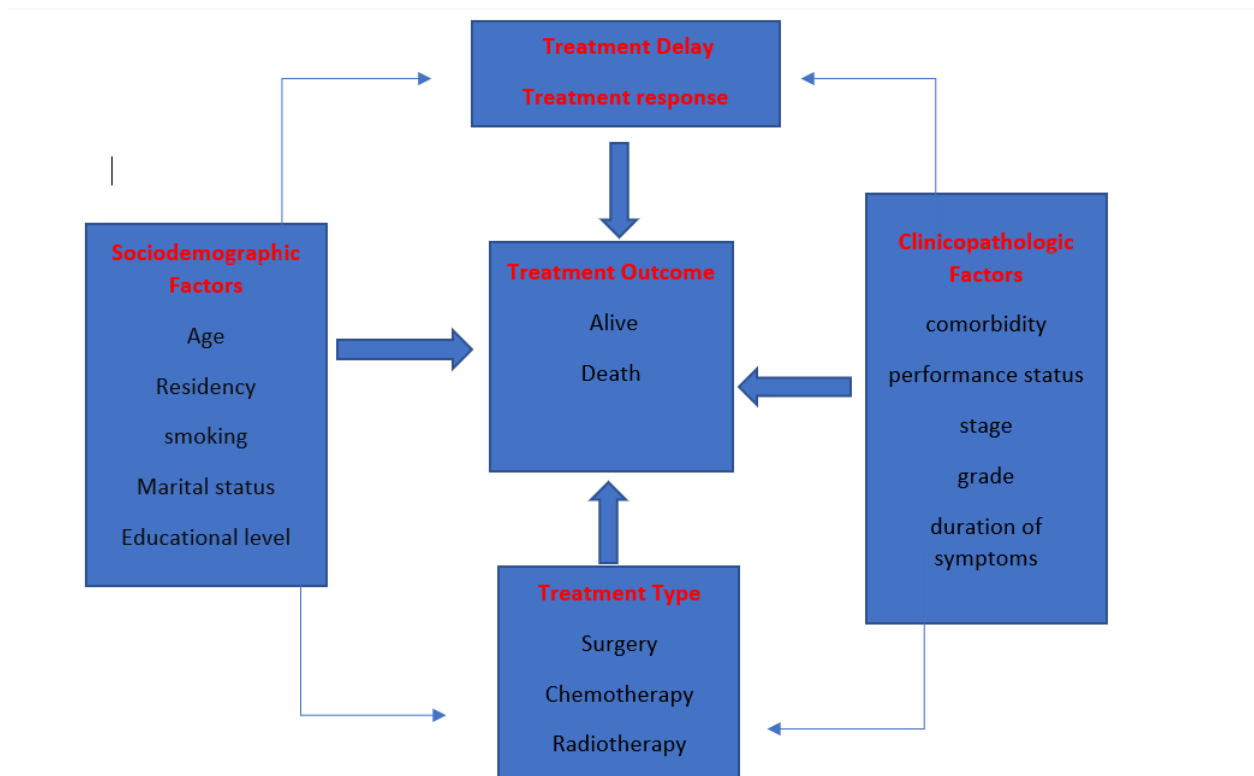


Figure 1: Conceptual framework indicating possible relationship between Dependent and independent variables

3. Objectives

3.1. General objective

- To evaluate treatment pattern and survival among vulvar cancer patients at Tikur Anbesa Specialized Hospital, Ethiopia from Jan 1 2019 to Oct 30, 2024

3.2. Specific Objectives:

- To identify the various treatment modalities administered to vulvar cancer patients at Tikur Anbesa Specialized Hospital during the study period.
- To determine survival outcome of vulvar cancer patient
- To identify factors affecting survival of vulvar cancer patients

4. Materials and Methods

4.1. Study Area and Period

This study was conducted at Addis Ababa University Oncology department (from Jun 1 2024 to Oct 30, 2024). Addis Ababa is the capital city of Ethiopia. Tikur Anbessa Hospital is one of Ethiopia's leading tertiary care centers, serving as a national referral hospital for complex cases and providing specialized care to patients from across the country, with a population of over 120 million. The Hospital provides health services for approximately 25 thousand inpatients and 400 thousand outpatients in a year with a bed capacity of 700. At present, the majority of Vulvar cancer cases are diagnosed and treated within gynecologic oncology and adult Oncology units.

4.2. Study design

A retrospective study was conducted, among adult cases of Vulvar Cancer attending TASH

4.3. Population

4.3.1 Source population

The source population was all cancer patients on follow up at TASH oncology center

4.3.2 Study population

All vulvar cancer patient, eligible for inclusion criteria, evaluated at oncology center during the study period.

4.4 Inclusion and Exclusion criteria

4. 4.1. Inclusion criteria

- Histologically confirmed vulvar cancer
- Adequate staging documentation
- Treatment Time Frame: Patients presented within the specified 5-year period (from January 1, 2019, to October 30, 2024)

4.4.2. Exclusion Criteria

- Another primary in addition to vulvar ca
- Incomplete Records: Patients with incomplete or missing medical records

4.5. Sample size and Sampling technique.

4.5.1. Sample size

The sample size for this study was determined by using a Cox proportional hazards model, Schoenfeld DA formula is used.

Previous study indicates that advanced FIGO stage patients had unfavorable outcomes (adjusted HR = 1.5; 95% CI, 0.25–.55) compared to patients' early stage (55). So, HR will be 1.5, margin of error (d) 0.05 and 95% confidence-interval critical value ($Z_{\alpha/2}=1.96$) and substituting the values gives. MR was 31%

- $$E = \frac{(Z_{\alpha/2} + Z_{\beta})^2}{(\ln HR)^2} = \frac{(1.96 + 0.84)^2}{(\ln 1.5)^2} = \frac{7.84}{0.1} = 78.4$$

- $$n = \frac{\text{number of events required}(E)}{\text{expected event rate in the population}} = \frac{78.4}{0.31} = 252$$

- but, assuming 10 % non-response rate, the sample size will be: $n=252+10\% \times 252 = 277.2$ because of the disease is rare and retrospective nature of our study we used convenient sampling by which all cases fulfilling the inclusion criteria during the study period was included with final analyzed sample of 89 patients.

4.5.2. Sampling technique

A convenient sampling technique was employed to recruit study participants until the achievement of the expected sample size within the given study period.

4.6. Study Variables

4.6. Study Variables

4.6.1. Dependent variables

- ✓ Overall survival

4.6.2. Independent variables

- ✓ Sociodemographic status
- ✓ Risk Factors,
- ✓ Clinicopathologic characteristics,
- ✓ Comorbidities,
- ✓ ECOG Performance Status,
- ✓ FIGO Stage of Cancer,
- ✓ Histological Type,
- ✓ Treatment Delay,
- ✓ Treatment response
- ✓ Treatment type (Radiotherapy, Chemotherapy, Surgery).

4.7. Operational definition

1. Treatment Pattern:

- o **Definition:** The specific regimen or combination of therapeutic interventions administered to vulvar cancer patients. This includes surgery, radiation therapy, chemotherapy, and any other modalities used alone or in combination.
- o **Measurement:** Documented from patient medical records, including types of treatments, duration, and sequencing of therapies administered from January 1, 2019, to October 31, 2024.

2. Survival:

- o **Definition:** The duration of time from the date of diagnosis to the date of death from any cause or the last date of follow-up if the patient is still alive.
- o **Measurement:** Recorded in months, using patient follow-up records, from the initial diagnosis date to either the date of death or the end of the study period on October 31, 2024.

3. Vulvar Cancer:

- o **Definition:** A malignant tumor that forms in the tissues of the vulva.
 - o **Measurement:** Diagnosed based on histopathological examination and classified according to the International Federation of Gynecology and Obstetrics (FIGO) staging system.
- 4. Patient Demographics:**
- o **Definition:** Characteristics of the patient population, including age, sex, ethnicity, and socioeconomic status.
 - o **Measurement:** Collected from patient records at the time of diagnosis and during treatment.
- 5. Clinical Characteristics:**
- o **Definition:** Medical conditions and features of the disease in patients, such as tumor stage, grade, histology, and presence of comorbidities.
 - o **Measurement:** Extracted from patient medical records and diagnostic reports.
- 6. Factors Associated with Treatment Outcomes:**
- o **Definition:** Variables that may influence the effectiveness of treatment and survival rates, including patient age, tumor stage, treatment type, and comorbid conditions.
 - o **Measurement:** Analyzed using patient medical records, treatment data, and statistical methods to identify significant predictors of outcomes.
- 7. Performance Status:**
- o **Definition:** Performance status refers to a patient's general well-being and ability to carry out daily activities. It is an important prognostic factor in cancer treatment and can influence treatment decisions and outcomes.
 - o **Measurement:** Performance status will be assessed using the Eastern Cooperative Oncology Group (ECOG) Performance Status Scale, which is a standardized measure. The ECOG scale ranges from 0 to 5, from good to poor performance

8. Stage of Vulvar Cancer:

- o **Definition:** The stage of vulvar cancer refers to the extent of the disease based on the size of the tumor, the involvement of lymph nodes, and the presence of metastasis. Staging is crucial for treatment planning and prognosis.
- o **Measurement:** The stage of vulvar cancer will be determined using the International Federation of Gynecology and Obstetrics (FIGO) staging system, which is widely used for gynecologic cancers. The FIGO staging for vulvar cancer:

9. Treatment Intent

a) Radical Treatment

Treatment intended to completely eradicate the cancer, typically involving surgery (e.g., radical vulvectomy), radiation therapy, chemotherapy, or a combination of these. The goal is curative.

- Example indicators: Complete tumor excision, aggressive multimodal treatment plans.

b) Palliative Treatment

Treatment aimed at alleviating symptoms, improving quality of life, and possibly prolonging survival without intending to cure the disease.

- Example indicators: Symptom-focused radiation or chemotherapy, pain management interventions, or limited surgical procedures.

10. Treatment Response

a) Responder

Patients who show a measurable reduction in tumor burden following treatment.

- Complete Response (CR): Disappearance of all target lesions for at least 4 weeks, with no new lesions detected.
- Partial Response (PR): A $\geq 30\%$ reduction in the sum of the diameters of the target lesions compared to baseline, sustained for at least 4 weeks.

b) Non-Responder

Patients who show little or no reduction in tumor burden or disease progression despite treatment.

- Stable Disease (SD): Tumor size does not meet the criteria for PR or progressive disease (PD). Changes in tumor size are minimal and fall between a 20% increase and a 30% reduction.
- Progressive Disease (PD): A $\geq 20\%$ increase in the sum of the diameters of the target lesions or the appearance of new lesions.
- No Response Assessment: Patients who did not undergo post-treatment evaluation to determine response, regardless of treatment received.

Data collection procedures:

The data collection began with extracting electronic card numbers (I-CARE numbers) using variables available from the new patient registration, results, and follow-up appointment forms. These forms contained key details, including the patient's name, I-CARE number, date, age, and diagnosis. Initially, 120 cases were identified for review. Each I-CARE number was cross-referenced with the electronic patient data documentation system (I-CARE) for validation and further analysis.

During the review process, several cases were excluded based on predefined criteria. Ten cases were excluded due to misdiagnosed conditions (8 cervical cancer and 2 vaginal cancer), while another 10 cases were excluded due to old card numbers that could not be retrieved from the system. Four cases were identified as non-squamous cancers, comprising 3 cases of melanoma. Additional cases were excluded due to inadequate documentation, ultimately leaving a final dataset of 89 cases for analysis.

For the remaining 89 cases, data was collected using a standardized data extraction tool applied to the I-CARE system. To complement the information and address missing data, phone calls were made to the patients or their families to inquire about the patients' vital status. Out of the 89 cases, contact was successfully made with 75 patients or their families, while the remaining cases could not be followed up due to nonfunctional phone numbers.

Data management and statistical analysis:

The original data collected in Microsoft Excel, was reviewed to ensure completeness and consistency before being exported to SPSS® version 26 (IBM®, New York, USA) for analysis. Normality tests were performed using visual inspections of histograms, Q-Q plots, and the Kolmogorov-Smirnov and Shapiro-Wilk tests. Descriptive statistics were used to summarize the study variables, with categorical variables presented as frequencies and percentages, and continuous variables described using the mean and standard deviation (SD) or median and interquartile range (IQR). Log Rank (Mantel-Cox), Breslow (Generalized Wilcoxon), and Tarone-Ware tests were applied to assess the equality of survival distributions based on the need for mechanical ventilation. Additionally, Kaplan-Meier curves were used to evaluate patients' survival during their hospital stay. A p-value of less than 0.05 was considered statistically significant for all analyses.

4.9. Ethical statement

Ethical clearance and approval for the study was obtained from Institutional Ethics Review Board of Health Institute, Addis Ababa University. Permission was obtained from AAU administration and privacy will be maintained

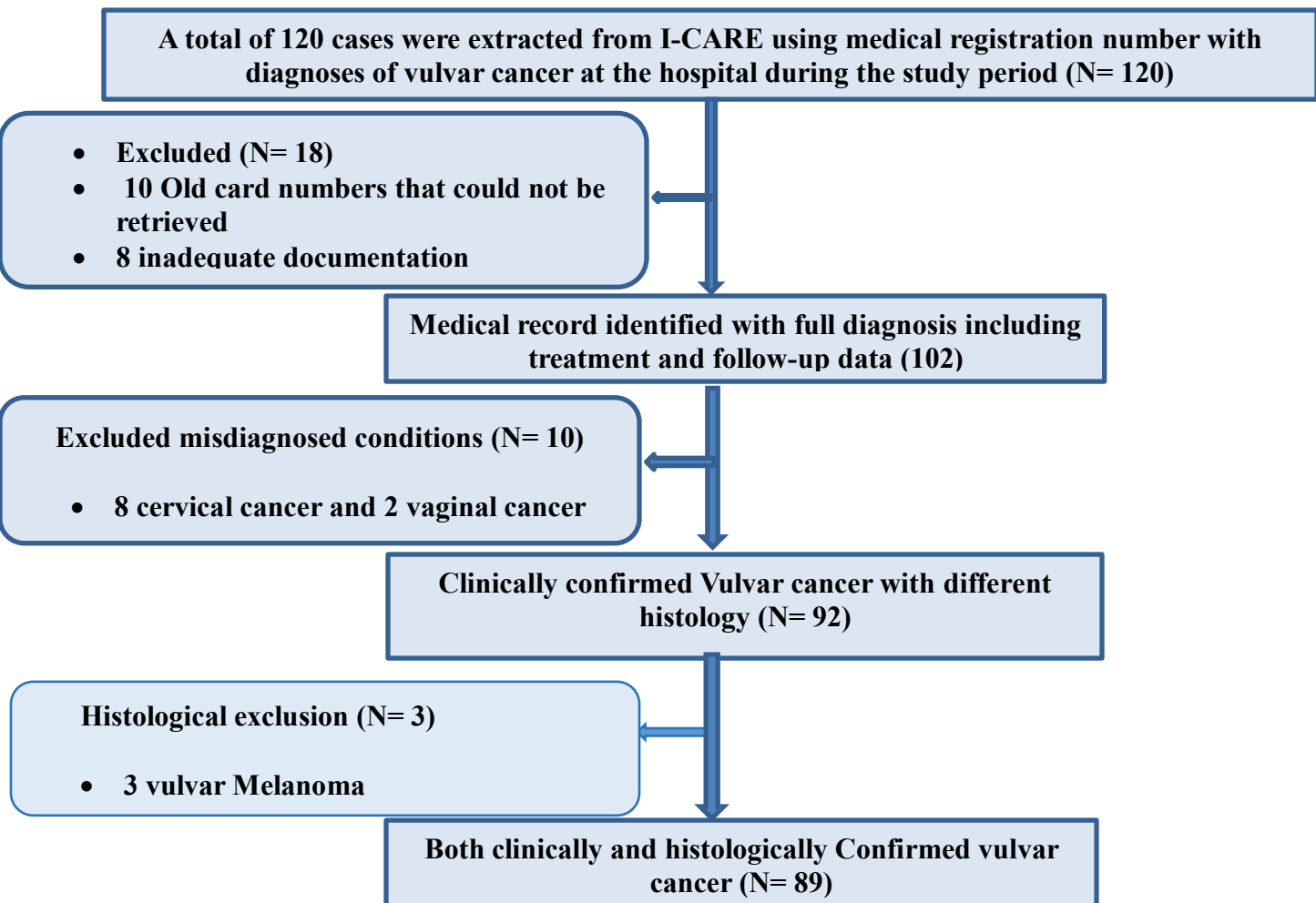
4.10. Dissemination plan and use of the result

The findings of this study will be presented to the department of Clinical Oncology for thesis defense. Summary report will be submitted to AAU and result will also be communicated to clinicians who treat the patient to identify factors that could be focused on to improve outcome in this setting. Effort will be made to publish the findings in peer reviewed journals.

5. Results

A total of 120 cases were initially extracted and reviewed using the electronic patient data documentation system (I-CARE). Exclusions included 10 cases due to misdiagnoses (8 cervical cancer and 2 vaginal cancer), 10 cases with unretrievable old card numbers, 4 cases of non-

squamous cancers (2 melanoma and 2 adenocarcinoma), and additional cases due to inadequate documentation, leaving a final dataset of 89 cases (flow chart below)



A total of 89 patient files were analyzed to evaluate the primary endpoint of overall survival among individuals diagnosed with vulvar cancer. Of these, 31 patients (34.8%, 95% CI: 12.2-19.8%) died, while the remaining patients were censored. The median follows up duration was 17 months (IQR: 7-27), range from 1 to 59 months.

5.1 Socio-demographic and Clinical Profile:

The median age of the patients was 45 years (IQR: 32–60), ranging from 20-91 years. Most patients (32, 36.4%) resided in Addis Ababa, and 57 (64%) were married. A substantial proportion (40, 44.9%) were illiterate and reported having multiple sexual partners. Despite the high-risk profile, only 16 (18%) patients had undergone cervical cancer screening. Among those screened, 12 (75%)

patients had normal findings and three (18.75%) patients had high-grade squamous intraepithelial lesions (HSIL) and were advised to undergo treatment.

HIV infection was prevalent in the study population, with 60 (67.4%) patients were HIV positive, 17(19.1%) were negative, and 12(13.5%) patients had no documentation of HIV status. The median age of patients with HIV positive was 40 years (IQR: 35–47) and for patients with HIV negative was 58 years (IQR: 50–67). Among the HIV positive patients, base line CD4 counts were documented in only 29(48%) patients of these, 18 (30%) patients had CD4 counts above 500 cells/ μ L, while 11(18.3%) had CD4 counts below 500 cells/ μ L during the diagnosis of vulvar cancer. The median duration of HIV diagnosis was 12 years, ranging from 1 to 20 years. A majority of patients (35, 58.3%) have/had been living with the disease for more than 10 years. All HIV-positive patients were receiving highly active antiretroviral therapy (HAART) (table 1).

5.2 Pattern of Hospital visit and deaths:

Among the total 89 patients with vulvar cancer, the highest number of visits consistently occurred between May and November across most years: November 2019 (5, 5.6%), November 2020(4, 4.5%), and January, march and May of 2021 (4, 4.5%). Majority of visits occur on year 2021, 2022 and 2023 accompanying 76(85.4%) of overall visit.

The majority of deaths occurs on year 2023(14, 15.7%) and 2024 (9, 10.11%) (Figure 2A and Figure 2B).

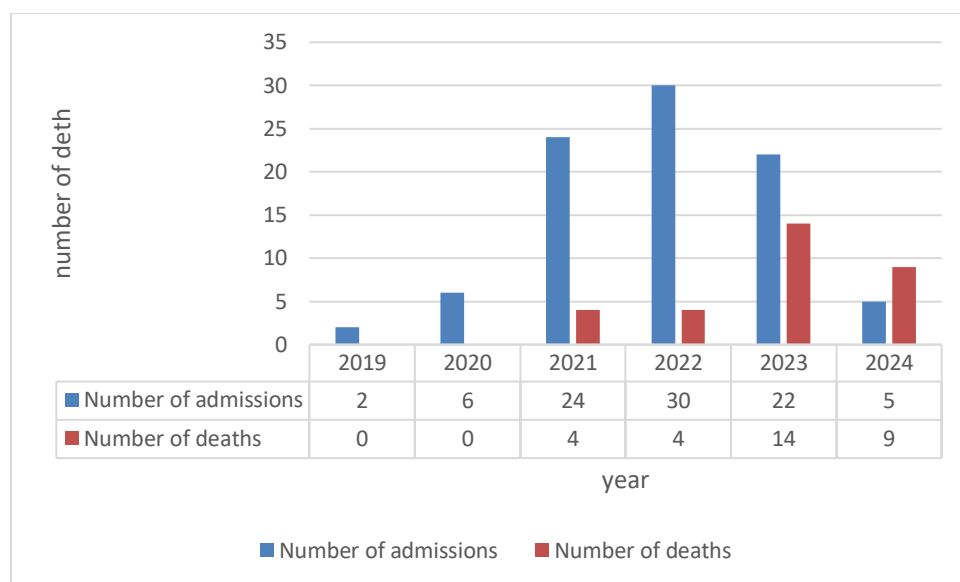


Figure 2b: comparison of number of admissions and number of deaths with their respective years among patients with vulvar cancer at TASH from 2019 to 2024 (N=89)

5.3 Clinical presentation and diagnosis

The most common initial symptoms at presentation were vulvar or groin mass 65 (73%), vulvar itching 46 (51.1%) and vulvar or groin ulceration 45(50.6%), while bleeding was reported in 15 (17%) cases. Regarding the diagnostic evaluation, punch biopsy was the primary diagnostic tool in 69 (77.5%) patients, followed by excisional, incisional biopsy, and fine-needle aspiration cytology (FNAC). At the time of diagnosis, a significant proportion of patients presented with advanced disease, predominantly FIGO stage III, followed by Stage IVB (figure 3). Distant metastasis was present in 16 (18%) patients, pelvic LNs being the most frequent site of metastasis. The majority of patients 74 (83.1%) had favorable Eastern Cooperative Oncology Group (ECOG) performance status (scores of 0 and 1), and comorbidities were relatively uncommon, with hypertension(n=8), diabetes(n=2), and renal disorders(n=2) were reported (table 1).

Table 1: Socio-demographic and clinical profile at diagnosis among adult vulvar cancer patients on follow up at oncology unit of TASH, Addis Ababa Ethiopia, 2024.

Characteristics	Frequency (%)	Median (IQR)	Died 31(34.8%)
Age		45(32–60)	
<30	6(6.7)		2(6.45)
30-39	24(27.0)		7(22.6)
40-49	26(29.2)		5(16.13)
50-59	16(18.0)		9(29.03)
>=60	17(19.1)		8(25.8)
Marital status			
Married	57(64)		21(67.7)
Divorced	9(10.1)		2(6.5)
Single	12(13.5)		5(16.1)
Widowed	11(12.4)		4(12.9)
Residence			
Addis Ababa	33(37.1)		9(29.0)
Non-Addis Ababa	56(62.9)		22(71.0)
Presenting symptoms			
Vulvar or groin mass	65(73)		15(48.4)
Vulvar itching	46(51.7)		5(16.13)
Vulva or groin ulceration	45(50.6)		3(9.7)
Vulvar or pelvic pain	27(30.3)		4(12.9)
Bleeding	15(17)		8(25.8)
other	16(18)		1(3.22)
Duration since the onset of symptoms			
ECOG performance at diagnosis			
0	5		0
1	69		21(67.74)
2	12		8(25.80)
3	2		1(3.22)
4	1		1(3.22)
Distance metastasis at presentation			
Yes	16(18)		3(9.7)
No	70(78.65)		27(87.1)
Not documented	3(3.35)		1(3.2)
Comorbidity			
Yes	12		1(3.2)
No	77		17(54.84)
Cervical cancer screening			
Yes	16(18)		2(6.5)
No	66(74.2)		25(80.6)
Not documented	7(7.8)		4(12.9)
HIV status			

Positive	60(67.4)		21(67.7)
Negative	17(19.1)		2(6.5)
Not documented	12(13.5)		8(25.8)
Multiple Sexual partner			
Multiple	59(62.3)		19(61.0)
Single	22(24.7)		9(29.0)
Not documented	8(13)		3(9.7)
CD4 at diagnosis of vulvar cancer(cells/μL)			
100-250	4(6.6)		
250-500	7(11.7)		
500-1000	13(21.6)		
>1000	2(3.3)		
Not documented	34(56%)		
Duration since the diagnosis of HIV (years)		12 (8-15)	
Taking HAART			
Yes	60(100)		21(67.7)
No	0(0.0)		

5.4 Planned primary treatment modality of patients:

The majority of patients (69; 77.52 %) planned to receive a radical treatment, while 14(15.73%) patients intended for a palliative treatment. The treatment intent was not documented for 6 (6.75%) patients. However, due to various challenges, only 37 (53.62%) patients received the planned radical treatment (figure 3).

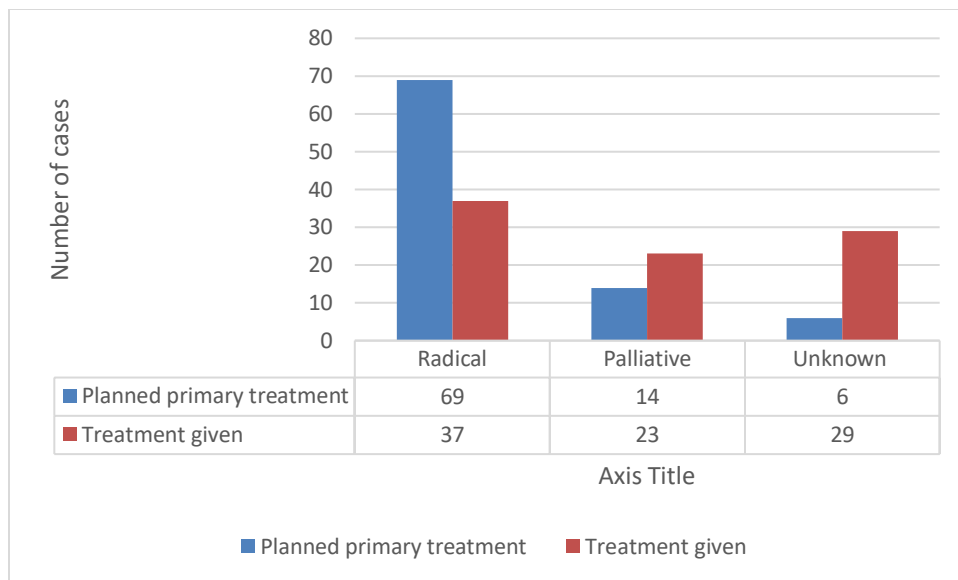


Figure 3: graphic representation of Planned vs received primary treatment modality at diagnosis among adult vulvar cancer patients on follow up at oncology unit of TASH, Addis Ababa Ethiopia, 2024.

5.5 Treatment patterns of patients:

Out of the 89 patients—in the study, 39 (48.1%) received chemotherapy. The intent of chemotherapy was neoadjuvant in 18(46.1%), concurrent in 11(28.2%), and palliative in 10 (25.6%) patients. The average number of chemotherapy cycles administered was 3.5.

Radiotherapy was administered to 33 patients (37.07%). Among these, 17(51.51%) received definitive treatment (concurrent chemoradiotherapy or radiotherapy alone), 13(39.4%) received palliative radiotherapy, and 3 received adjuvant radiotherapy.

Among those who underwent surgical treatment as the primary modality, the majority of patients (11, 45.8%) received radical vulvectomy with inguinofemoral lymph node dissection, and 9 (37.5%) underwent wide local excision alone. Lymph node harvesting was conducted in most cases, but lymphovascular invasion was identified in only one case. Notably, marginal status was known for 20 patients, with 14 (58%) had negative and 6(25%) had positive margins (table 2).

Table 2: Treatment patterns of patients given for adult vulvar cancer patients on follow up at oncology unit of TASH, Addis Ababa Ethiopia, 2024. 18(46.1%) concurrent 11(28.2%), or palliative 10(25.6%).

Characteristics	Frequency (%)	Median (IQR)	Died 31(34.8%)
Chemotherapy	39(43.8)		18(58.6)
Neoadjuvant	18(46.1)		8(25.8)
Concurrent	11(28.2)		1(3.2)
Palliative	10(25.6)		4(12.9)
Radiotherapy intent	33(37)		19(61.3)
Definitive	17(51.5)		5(16.1)
Adjuvant	3(9.1)		2(6.45)
palliative	13(39.4)		12(38.71)
Surgical treatment	24(27)		4(12.9)
Radical vulvectomy with inguinofemoral LN dissection	11(45.8)		2(6.45)
Wide local excision alone	9(37.5)		1(3.22)
Wide local excision plus inguinofemoral LN dissection	3(12.5)		1(3.22)
Radical vulvectomy alone	1(4.2)		
LN harvested	14(58.3)		2(6.45)
Number of LN harvested			
6	2(14.2)		1(3.22)
8	4(28.5)		1(3.22)
13	1(7.1)		
14	2(14.2)		
15	1(7.1)		
18	1(7.1)		
Not documented	3(21.3)		
Pathologic T stage	23(25.8)		3(9.6)
0	2(8.7)		0
1	17(73.9)		2(6.45)
2	4(17.4)		1(3.22)
Marginal status	20(22.5)		3(9.6)
Positive	6(30)		3(9.6)
Negative	14(70)		0

5.6 Treatment outcome of patients:

Among the patients included in the study, half (45, 50.6%) experienced treatment delays. Of these, 25(55.5%) patients had delays exceeding 12 months. The major factors contributing for these delays were financial constraints and prolonged waiting lists, which accounted for approximately one-third of these delays (table 3).

During follow-up, majority 37(41.6%) of case had no documented response rate. Of the documented cases, 25 (28.1%) achieved a complete response,15(16.9%) had partial response, 4 (4.5%) had progressive disease, and 3(3.4%) had stable disease at three months after primary treatment. Among those with complete response, 8 patients (32%) experienced recurrence, with 5 cases were locoregional recurrence ,2 cases had local, and 1 case with locoregional and distant metastasis. In most cases, recurrence was diagnosed more than six months after completing primary treatment.

Palliative treatments, including radiotherapy and chemotherapy, were administered to 13 (14.6%) and 10 (11.2%) patients, respectively. The primary indications for palliative radiotherapy were vulvar bleeding and intractable pain.

Table 3: Treatment outcome of patients with the diagnosis of vulvar cancer on follow up at oncology unit of TASH, Addis Ababa Ethiopia, 2024.

Characteristics	Frequency (%)	Median (IQR)	Died 31(34.8%)
Treatment delays	45(50.6)		20(22.4)
Duration of treatment delay (months)			
<3	2(1.1)		1(1.1)
3-6	9(20)		4(4.5)
6-12	9(20)		4(4.5)
>12	25(55.5)		11(12.4)
Reason for treatment delay			13(14.6)
Financial	8(17.8)		4(4.5)
Waiting list	35(77.8)		8(9.0)
other	2(4.4)		1(1.1)
Response to any initial therapy	Total 89		Total 31
Complete	25(28.1)		2(6.45)
Partial	15(16.8)		4(4.5)

Progressive	4(4.5)		4(4.5)
Stable	3(3.4)		1(1.1)
Not documented	37(41.6)		17(54.8)
Over all Recurrence	10(8.7)		2(6.45)
Time to recurrence (months)	10 (8.7)		
3-6	2(20)		
6-12	2(20)		1(3.22)
>12	6(60)		1(3.22)
Means of recurrence diagnosis	10		
Biopsy with imaging	6(60)		
Imaging	4(40)		

5.7 Mortality:

The overall mortality rate was 34.8%. among patients who died of vulvar cancer, 18 (53%) were above 45 years of age, married, and came from outside the capital city. At the time of presentation, 25.8% had bleeding, while the rest presented with a vulvar mass accompanied by itching. The majority, 21(67%) had a good performance status, and FIGO stages III and IV predominated, accounting for 71% (22 / 31) of the cases. Regarding HIV status, 21 (68%) were HIV positive, 8 (25.8%) were undocumented, and only 2 patients were negative. In terms of treatment, the majority of deaths were observed among patients who either did not receive any treatment or were treated with palliative intent, each accounting for 13(41.9%) of the total mortality. Additionally, 11(12.4%) patients experienced a treatment delay of more than one year. Response rate were not documented in 17(55%) patients, with the remaining patients having partial or progressive disease.

5.8 Survival analysis

The Kaplan–Meier estimator, along with the equality test, was used to estimate survival curves for categorical predictors. In univariate analysis, factors such as response to initial therapy, primary treatment modality (surgery), radical intent of radiotherapy, performance status at presentation (ECOG), FIGO staging at diagnosis were significantly associated with survival outcomes ($p < 0.05$) educational attainment (high school or more) was added for multi-variate analysis by using cut off p value of <0.25 . (Supplementary Table 1).

Of all women died during follow up, the cumulative overall survival rate at 1 and 2 years was 83% and 62%, respectively (figure 5).

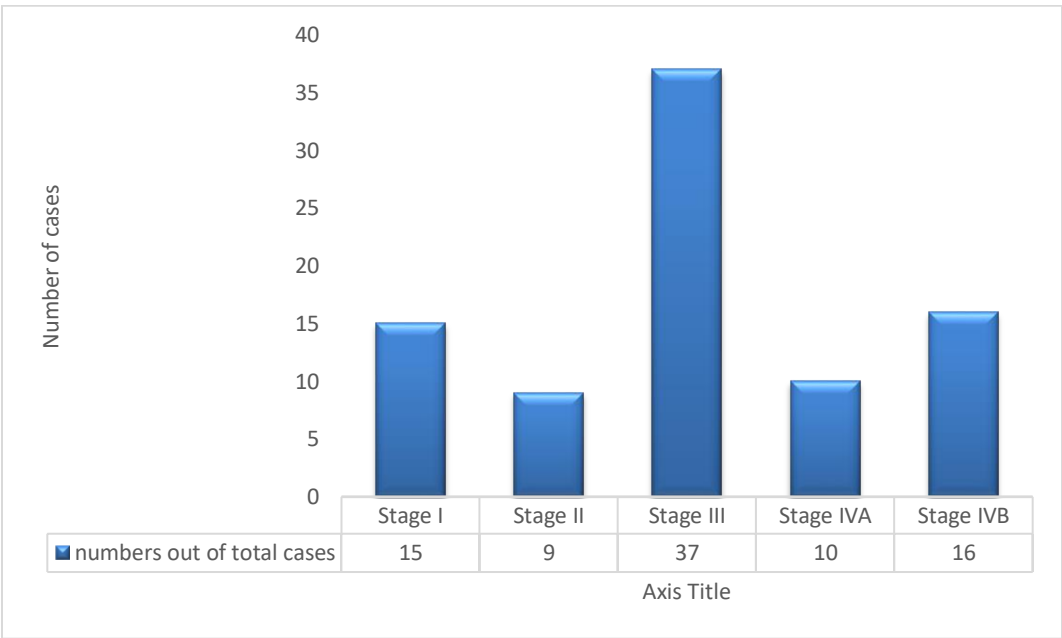


Figure 4. Graphical representation of the FIGO staging of adult patients diagnosed with vulvar cancer on follow-up at the oncology unit of Tikur Anbesa Specialized Hospital (TASH), Addis Ababa, Ethiopia, 2024.

Patients with vulvar cancer who demonstrated favorable ECOG performance status at presentation, underwent radical radiotherapy, had surgery as the primary treatment modality, those diagnosed at an early FIGO stage, and responded to initial therapy showed a higher probability of survival. However, in multivariate analysis, only response to initial therapy remained a significant predictor of survival (Supplementary Table 1).

5.9 Predictors of Survival

Univariate Cox regression analyses were conducted to assess individual factors associated with the hazard of death among vulvar cancer patients. Variables with fewer than five occurrences were excluded due to insufficient sample size for reliable estimates. Candidate variables for the final

multivariate analysis were selected based on their statistical significance in the univariate analyses. Significant factors—including response to initial therapy, primary treatment modality (surgery), radical intent of radiotherapy, performance status at presentation (ECOG), and FIGO staging at diagnosis were then included in the multivariate Cox regression analysis (supplementary figures).

Patients who demonstrated a response to initial therapy, whether a partial or complete response, were 22 times more likely to survive (AHR: 22.3, 95% CI: .191-.041, $p=0.036$) compared to those who did not respond, had progressive or stable disease, no response assessment (figure 6). Delay in planned treatment emerged was significantly high in our study.

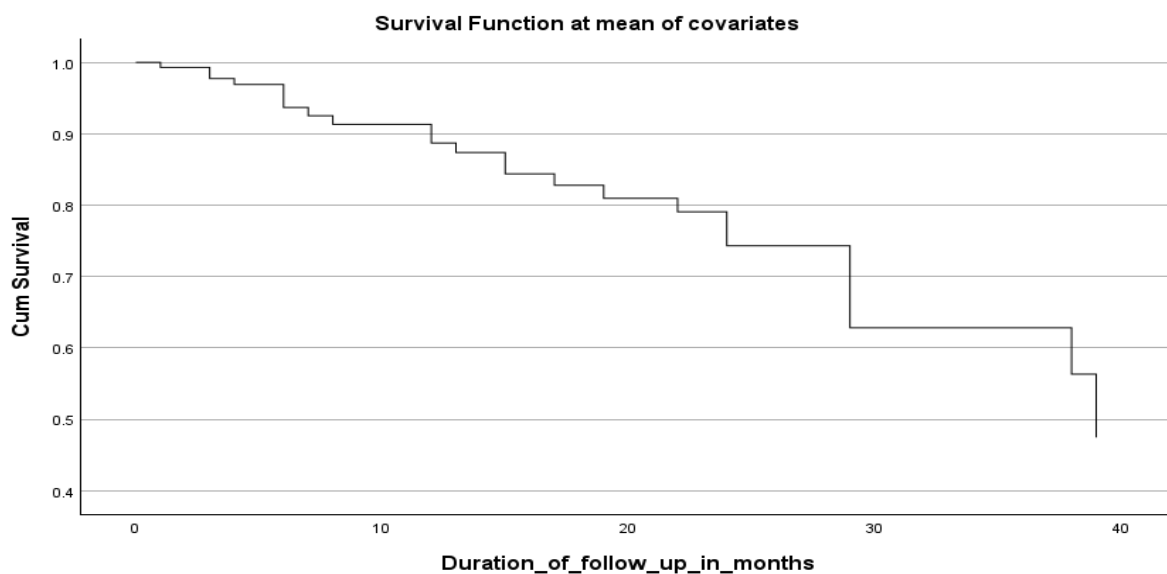


Figure 5. Cumulative overall survival probability of the total VC patient

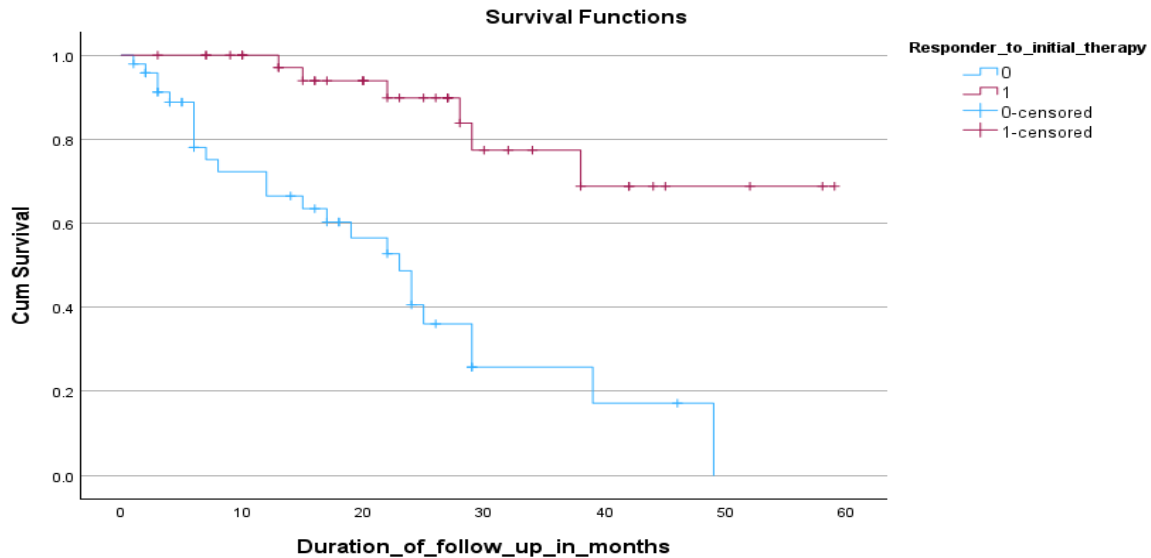


Figure 6. Showing survival of Patients who demonstrated a response to initial therapy, whether a partial or complete response, were 22 times more likely to survive [AHR: 22.3, 95% CI: (.191-.041), $p=0.036$] compared to those who did not respond, had progressive or stable disease and not given any treatment.

6. Discussion:

The majority of patients in this study were young adults, with a median age of 45 years. This aligns with findings from a similar local study conducted in St. Poulos hospital in Ethiopia, and South Africa, which reported median age of 42 and 52.5 years, respectively [54,55], but younger than the median ages observed in studies from Germany, the United States, and other European countries, which were 57, 60, and 80 years, respectively [56-58]. The reason for the differences in age distribution may be the high prevalence of HIV and HPV infections in Africa [55]. The association between HPV infection and vulvar cancer risk at a younger age, and the link between HIV and HPV is well known and has been described in many studies in vulvar and cervical cancer, respectively [59,60]. In our study two-third of vulvar cancer patients were HIV positive, have contributed to the overall lower median age. This finding highlights the need for HPV vaccination, awareness creation and integration of Vulvar cancer screening program for HIV patients for vulvar cancer prevention, and early detection. Moreover, advise all vulvar cancer patients to have HIV test, which further improve the outcomes of cancer treatments. Further research should investigate the underlying factors contributing to the younger age of patients in this population.

Addis Ababa accounted for the highest number of patients, with cases from outside capital city referred from larger regions such as Oromia and Amhara. This pattern may be attributed to factors such as population density, improved healthcare access, and patients' characteristics.

The most common symptoms at presentation were vulvar or groin mass followed by Vulvar itching and ulceration, while vaginal bleeding accounting in very small number of cases (17%), in line with the findings of previous studies [30,31].

The majority of vulvar cancer cases in this study were diagnosed advanced stage, with at FIGO Stage III and Stage IVB. This finding is similar with other African country [54,55,61], while in Western countries the majority were present at early stage [56]. Delay in diagnosis has been a known risk factor for advanced stage presentation in Africa, specially SSA [54,55,61]. The attributable for these delay in diagnosis in the region includes limited access to healthcare services, Socioeconomic constraints, low awareness and education levels, cultural and Social factors, healthcare system challenges, Biological and Disease-Related Factors, Psychosocial and Behavioral factors[55]. Similarly, these factors might be the reason for advanced stage presentation in our cases.

In our study, the majority of patient visits occurred in the years 2021, 2022, and 2023, accounting for 76 (85.4%) of the total visits. This distribution can be attributed to the implementation of the electronic patient data documentation tool (I-CARE) in 2021, which enhanced the consistency and accuracy of case recording. Furthermore, most deaths were documented in 2023 (14, 15.7%) and 2024 (9, 10.11%). The observed mortality trends align with the natural progression of advanced vulvar cancer, as mortality typically increases approximately two years after initial diagnosis or patient visits. This pattern is consistent with findings from prior studies on advanced vulvar cancer, which highlight a decline in survival outcomes over time [54,56,62]. The improved documentation since 2021 further supports the accuracy of these findings.

HIV infection was prevalent among 67.4% of the cases. This prevalence is notably higher than previously reported figures from the same setting and other African countries, where HIV prevalence among vulvar cancer cases were 57% in Ethiopia and 40% in South Africa [54,59]. The high HIV prevalence in this study may be attributed to factors such as the urban population from the capital city, the recent increase in prevalence of HIV in Ethiopia, and the presence of multiple sexual partners among a significant proportion of the participants. In contrast, the national prevalence of HIV in 2023 was only 1.2%, underscoring a significantly higher burden among vulvar cancer patients. These findings suggest a potential association between HIV and vulvar cancer, warranting routine HIV screening for all vulvar cancer patients. And need for incorporating a regular vulvar cancer screening for HIV patients for early detection.

The median follow-up duration in our study was 17 months (IQR: 7–27), which aligns with findings from other studies conducted in low- and middle-income countries (LMICs) [55,61,62]. However, this duration is significantly shorter compared to developed countries, where follow-up durations typically average around 64 months(d). These disparities may be attributed to differences in healthcare infrastructure, accessibility, and patient engagement, as well as variations in geographic and socio-demographic factors influencing initial presentation and continuity of care[55,62].

Our study revealed 1-year and 2-year survival rates of 83% and 62%, respectively, for vulvar cancer patients. These findings align with a local study conducted six years ago, which reported an 80% 1-year survival rate[54]. Compared to other African studies, there is a minimally increased survival in our 2-year survival rate, which was the 51% reported in Ethiopia and the 56.7% documented in Ghana[54,63]. This improvement may reflect advancements in accessibility quality radiotherapy, chemotherapy and surgical service, establishment of multi-disciplinary therapy (MDT) based treatment decision and better control of medical comorbidity. However, the findings from the United States, where a 5-year overall survival rate of 71% was reported, underscore the stark disparities in vulvar cancer outcomes between developing and developed countries. Patients in resource-limited settings continue to face disproportionately higher mortality risks, likely attributable to challenges such as limited access to guideline-based treatments, delayed diagnoses, and socioeconomic constraints. Efforts should focus on strengthening oncology care systems, including early detection programs, access to guideline-based treatments, and addressing socioeconomic barriers to improve survival outcomes in resource-limited settings.

Responders to initial therapy have consistently been identified as significant predictors of survival among vulvar cancer (VC) patients in both African and global studies, including those conducted in the USA and Ethiopia. In a study from Ethiopia, patients demonstrating a complete or partial response to initial therapy exhibited markedly improved survival rates compared to those with stable or progressive disease, aligning with the findings in our study [58]. Similar trends were observed in studies conducted in South Africa and other African nations, where initial therapeutic response served as a robust prognostic indicator [58]. Likewise, large-scale studies in the USA have shown that responders to primary therapy, whether through chemotherapy, radiotherapy, or surgery, have significantly better survival outcomes than non-responders [57,58,63]. These observations reinforce the pivotal role of early therapeutic interventions in altering the disease trajectory of VC, underscoring the importance of timely and effective treatment strategies.

The clinical course of vulvar cancer observed in this study reveals high morbidity rates, with a substantial proportion of patients presenting advanced stage, prolonged delay in management, difficulty of receiving the intended primary treatment, lower rate of cervical cancer screening and high prevalence of HIV. The overall mortality rate of 34.8% reflects the serious nature of

this disease. In low-income countries, limited access to advanced diagnostic tools, specialized care, and expensive treatments such as radiotherapy or chemotherapy may exacerbate poorer outcomes compared to high-income settings [59,62]. Strengthening healthcare infrastructure, improving access to essential therapies, and providing training for healthcare professionals on screening and managing gynecological malignancies are critical strategies for enhancing outcomes for vulvar cancer patients in these regions.

Strength and limitation:

One of the key strengths of this study is its comprehensive review of medical records, allowing for a detailed analysis of patient demographics, clinical presentations, management strategies, and outcomes, particularly in resource-limited settings like Ethiopia. The combination of both retrospective and cross-checking with phone call approaches also enhances the reliability of the findings. However, there are notable limitations. The retrospective component may introduce biases due to significant incomplete medical records, which may not provide a full picture of the clinical characteristics and outcomes of vulvar cancer patients. Additionally, the findings may not fully represent the broader population of vulvar cancer patients in Ethiopia, as the data is limited to a single center. Moreover, limited access to advanced diagnostic tools and treatment options, such as PET, MRI studies and radiotherapy or chemotherapy, may have influenced patient outcomes, making it difficult to directly compare these results with those from higher-resource settings.

7. Conclusion:

This study provides valuable insights into the clinical characteristics, treatment profile and outcomes of vulvar cancer in Ethiopia, with broader implications for similar settings worldwide. The observed mortality rate significantly exceeds the global average, highlighting the urgent need for improved healthcare access, timely diagnosis, and early intervention strategies. Future research should focus on understanding the pathogenesis of vulvar cancer in diverse populations, the long-term outcomes of patients, and the effectiveness of preventive measures, including screening for cervical cancer, HIV and HPV in low-income countries. Overall, these findings emphasize the importance of raising awareness about vulvar cancer, improving diagnostic and treatment protocols, and enhancing healthcare infrastructure to better manage this serious gynecological condition in Ethiopia and similar settings.

Recommendations to Healthcare Professionals/Departments/Hospitals

- Improve early detection by increasing awareness of vulvar cancer symptoms and conducting routine gynecological exams.

- Ensure timely and appropriate patient referral for biopsy, imaging, and advanced treatment.
- Adhere to treatment timelines, including initiating radical or palliative therapy without unnecessary delays.
- Enhance multidisciplinary team coordination for effective treatment planning and follow-up care.
- Maintain standardized documentation and patient record-keeping for better continuity of care.
- Optimize pathology reporting using standardized formats to improve diagnostic accuracy.

Recommendations to Policymakers/Ministry of Health (MOH)

- Increase the availability of radiotherapy and chemotherapy facilities to reduce treatment delays.
- Develop and implement community-based health education programs to raise awareness about vulvar cancer and promote early diagnosis.
- Launch and sustain national screening programs for cervical and vulvar cancers in high-risk populations.
- Provide financial support mechanisms to reduce barriers to accessing timely care for underprivileged patients.
- Strengthen HIV care services, including regular monitoring and management of patients at risk for vulvar cancer.

Recommendations to Non-Governmental Organizations (NGOs) and Advocacy Groups

- Facilitate transportation and lodging support for patients traveling from rural areas to access treatment.
- Establish patient support groups to address the psychological and social needs of vulvar cancer patients.
- Advocate for increased funding for cancer care infrastructure and training for healthcare professionals.

Recommendations to Researchers and Academic Institutions:

- Conduct further studies to explore the role of comorbidities in influencing vulvar cancer outcomes.
- Focus on longitudinal research to track survival and recurrence patterns in resource-limited settings.
- Develop evidence-based guidelines to inform clinical practice and policy-making for gynecological cancers.

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Annexes

ANNEX ONE: DATA COLLECTION TOOL AND CONCENT FORM

A. Data collection tool and consent form English Version

Addis Ababa University college of Health Science Department of Clinical Oncology

English Version Consent Form containing page

Serial no _____ Card no _____ Name of study participant: _____

I have been requested to participate about this study, which plans to determine Treatment Patterns and Outcomes of Vulvar Cancer at Tikur Anbesa specialized hospital Oncology Center, Addis Ababa Ethiopia, 2024/25.

With full understanding of the situations that I agreed to give the informed consent voluntarily to the researcher to use my medical records taken for the research study. Moreover, I have had the opportunity to ask questions about the project and I have received clarification to my satisfaction. I was also told that results would be reported timely to the requesting physicians for the appropriate treatment and management of Vulvar cancer.

I agree that I am contributing to the research of my fellows by participating in this project. I have asked some questions and clarification has been given to me. I have given my consent freely to participate in the study, and I approve my agreement with my signature.

Participants' sign: _____ Date _____ Principal Investigator's sign: _____ Date _____

At what time the data collected while the patient is around having his/her medical record _____

