Section: Miscellaneous

Case Series

# SPECTRUM OF MALIGNANCIES IN HIV-POSITIVE PATIENTS: A CASE SERIES FROM A TERTIARY CARE CENTRE

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## ABSTRACT

**Background:** With increasing survival among people living with HIV (PLHIV) due to effective antiretroviral therapy (ART), the pattern of morbidity has shifted towards chronic diseases, including malignancies. HIV-associated cancers, both AIDS-defining and non-AIDS-defining, often present with atypical features, aggressive behaviour and therapeutic challenges due to immune suppression and treatment-related interactions.

**Case Presentation:** This retrospective case series includes four HIV-positive individuals with advanced-stage malignancies, identified from hospital medical records over a 6-month period. Data were collected from the HIV registry and oncology case sheets. The cases include cervical squamous cell carcinoma, poorly differentiated carcinoma of the hard palate, squamous cell carcinoma of the vaginal vault, and invasive papillary urothelial carcinoma of the bladder. All patients were on ART with varying degrees of immune reconstitution, yet presented with extensive disease requiring multidisciplinary intervention.

**Discussion:** All four patients demonstrated advanced-stage presentation and aggressive tumor behaviour. Literature shows that PLHIV are at increased risk for persistent oncogenic viral infections, especially HPV, contributing to cervical and anogenital cancers. Immunosuppression (CD4 count <200 cells/μL) and high viral loads are strongly associated with higher cancer incidence and poorer outcomes. Even with immune reconstitution, risk persists. Early screening, long-term follow-up, and multidisciplinary care are critical.

**Conclusion:** Malignancies in PLHIV remain a significant clinical concern. Vigilant screening, early ART initiation, and personalized oncologic strategies are essential to improve outcomes. This series highlights the ongoing need for integrated HIV-cancer care in both resource-rich and resource-limited settings.

## INTRODUCTION

People living with Human Immunodeficiency Virus (PLHIV) are at increased risk for developing certain malignancies due to prolonged immunosuppression, chronic inflammation, co-infection with oncogenic viruses, and lifestyle-associated risk factors.[1] With the introduction of antiretroviral therapy (ART), life expectancy among PLHIV has improved significantly, leading to a shift in disease burden from opportunistic infections to chronic conditions, including malignancies.[2]

HIV-associated malignancies are broadly categorized into AIDS-defining cancers (ADCs)—which include Kaposi's sarcoma, invasive cervical carcinoma, and non-Hodgkin lymphoma—and non-AIDS-defining cancers (NADCs), such as lung, liver, anal canal, and bladder cancers.[3,4] NADCs have become increasingly prevalent as PLHIV age and live longer, often outnumbering ADCs in incidence in the post-ART era.[5] These cancers frequently present at an advanced stage, are more aggressive, and are associated with poorer prognoses due to factors such as delayed diagnosis, ART-related drug interactions, limited treatment tolerance, and coexisting immunosuppression.[6]

The pathogenesis of HIV-related malignancies is multifactorial. Chronic immune activation and loss of immune surveillance facilitate the emergence of malignant clones.[7] Coinfections with oncogenic viruses such as Human Papillomavirus (HPV), Epstein-Barr Virus (EBV), and Hepatitis B or C further contribute to carcinogenesis.[8] Despite immune reconstitution with ART, the risk of some cancers remains elevated compared to the general population.[9]


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**Case presentation**

This is a retrospective case series conducted at a tertiary care centre in South India. Data were collected over a 6-month period from the hospital's HIV registry and oncology department records. HIV-positive patients diagnosed with malignancies during this period were identified and reviewed. Demographic details, CD4 counts, ART history, cancer diagnosis, imaging findings, histopathology, treatment modalities, and outcomes were recorded from patient files. Only cases with confirmed histopathological diagnoses and adequate clinical documentation were included. Ethical approval was obtained from the institutional ethics committee for this record-based study.

**Case 1:** A 50-year-old female, known HIV-positive since 2011, on ART with a CD4 count increased from 161 to 681. She was diagnosed with invasive squamous cell carcinoma of the cervix (large cell, non-keratinizing type), post-radical radiotherapy, with MRI indicating a recurrent lesion. Colonoscopy showed a bulge in the lower rectum, suggesting tumor invasion.

**Case 2:** A 60-year-old male with carcinoma of the hard palate (T4b, N2b, M0) and residual disease post-radiotherapy. Diagnosed HIV-positive in 2018, on ART with CD4 count of 110. PET-CT showed widespread metastases, including lymph nodes, adrenal glands, perineal tissue, mesentery, and testis. Histopathology confirmed poorly differentiated carcinoma. He received palliative COPP regimen and 5-FU.

**Case 3:** A 69-year-old female, post-hysterectomy, presented with stage IVa keratinized squamous cell carcinoma of the vaginal vault. HIV-positive with a CD4 count of 387. CT showed vault infiltration. Managed with palliative radiotherapy followed by three cycles of 5-FU and carboplatin.

**Case 4:** A 61-year-old male with invasive papillary urothelial carcinoma of the bladder (T1/2N0M0), on ART. CD4 count-280.CT-KUB revealed diffuse bladder wall thickening. Underwent TURP and was subsequently treated with radical radiotherapy and is currently on palliative chemotherapy.

The description of the cases was described in [Table 1]

**Table 1: Laboratory Diagnostic Profile of HIV-Positive Patients with Malignancies**

| Parameter | Case 1 | Case 2 | Case 3 | Case 4 |
|---|---|---|---|---|
| Age / Sex | 50 / Female | 60 / Male | 69 / Male | 61 / Male |
| HIV Diagnosis Year | 2011 | 2018 | [Not specified] | [Not specified] |
| ART Status | On ART | On ART | On ART | On ART |
| CD4 Count (cells/mm³) | 161 → 681 | 110 | 387 | 280 |
| Viral Load | Undetectable | 12500 copies/ml | 450 copies/ml | 920 copies/ml |
| Tumor Site | Cervix (invasive squamous cell carcinoma) | Hard palate (poorly differentiated carcinoma) | Vaginal vault (keratinized squamous cell carcinoma) | Bladder (invasive papillary urothelial carcinoma) |
| Histopathology | Large cell, non-keratinizing squamous carcinoma | Poorly differentiated carcinoma | Keratinizing squamous cell carcinoma | Papillary urothelial carcinoma |
| Imaging Findings | MRI: Recurrent lesion; colonoscopy: rectal bulge | PET-CT: Widespread metastases (LN, adrenal, testis, etc) | CT: Vault infiltration | CT-KUB: Diffuse bladder wall thickening |
| Stage (TNM/FIGO) | Recurrent | T4b, N2b, M0 | FIGO IVa | T1/2, N0, M0 |
| Biopsy Site | Cervix | Oral cavity (palate) | Vaginal vault | Bladder |
| Co-infections Suspected | HPV (implied) | Unknown | HPV (possible) | None reported |

## DISCUSSION

Despite improvements in HIV care, managing malignancies in people living with HIV (PLHIV) remains a significant clinical challenge. Antiretroviral therapy (ART) has extended life expectancy, yet this has also led to a rising burden of both AIDS-defining and non-AIDS-defining cancers (NADCs), many of which are aggressive and diagnosed at later stages. [10,11]

Drug-drug interactions between ART and chemotherapy agents are a major therapeutic barrier. Many antiretrovirals and anticancer agents are metabolized by cytochrome P450 enzymes, which can lead to reduced efficacy or increased toxicity when co-administered. [12,13] Despite these challenges, studies show that standard cancer therapies can be effective in HIV-positive patients when individualized to account for ART interactions and immune status.[14]

Treatment outcomes are often poorer in PLHIV due to factors including late-stage presentation, coinfections, and reduced treatment tolerance.[15,16] For example, lung and breast cancers in PLHIV often present earlier and progress faster than in HIV-negative individuals, with lower survival rates.[11]

Polypharmacy, common in aging HIV populations, further complicates care. Overlapping toxicities and DDIs between ART and drugs used to treat cancer and comorbidities contribute to worse outcomes unless proactively managed.[17]

Moreover, exclusion of PLHIV from many cancers clinical trials limits evidence-based guidance on optimal regimens. There's a pressing need for HIV-inclusive oncology trials to inform tailored care strategies.[15]


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Close collaboration between oncologists and HIV specialists is vital. Multidisciplinary care improves prognosis and facilitates personalized treatment planning that balances oncologic efficacy with HIV disease control.[13]

**Limitations & broader perspective**

Our cohort reflects resource-limited settings where screening coverage may be low and delayed presentations common. While ART mitigates risk, it does not fully restore HPV-specific immunity or eliminate cancer risk. Drug–drug interactions and tolerance to chemotherapy remain clinical challenges in PLHIV.

## CONCLUSION

These four cases exemplify the dual threat faced by PLHIV—persistent oncogenic infections (like HPV) and increased susceptibility to both ADCs and NADCs driven by immune impairment. The literature strongly supports earlier ART initiation, tight virologic control, frequent cancer surveillance, and tailored oncologic care. Integrating routine malignancy screening into HIV care, especially for aging and long-term ART-treated PLHIV, may help improve outcomes and reduce healthcare impact.

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