

Pulmonary Kaposi's Sarcoma in a Patient Infected with Human Immunodeficiency Virus 1: Successful Treatment with Paclitaxel

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Abstract

The incidence of Kaposi's sarcoma on HIV-1-infected patients declined in the post-antiretroviral therapy (ART) era. Furthermore, pulmonary Kaposi's sarcoma constituted a smaller proportion of all Kaposi's sarcoma patients. The treatment of Kaposi's sarcoma depends on the disease severity. Chemotherapy with ART is crucial in the treatment of pulmonary Kaposi's sarcoma. Moreover, paclitaxel and pegylated liposomal doxorubicin are used for the treatment of this disease, and their effects are comparable. Various doses and schedules were adopted by different clinicians. In this study, we present a patient diagnosed with pulmonary Kaposi's sarcoma, treated with high dose of paclitaxel (200 mg/m², every 2 weeks) for this disease entity and achieved an excellent outcome. (J Intern Med Taiwan 2018; 29: 175-179)

Key Words: Pulmonary Kaposi's sarcoma, HIV, Paclitaxel

Introduction

Kaposi's sarcoma is one of the acquired immunodeficiency syndrome (AIDS)-defining diseases that appeared in HIV-infected patients. It is an angioproliferative tumor caused by the infection of human herpes virus-8 (HHV-8) ¹.

The predisposing factor is the low level of CD4 count. The incidence rate is decreasing after the adoption of combination antiretroviral therapy (cART). Pulmonary Kaposi's sarcoma only constitutes a small proportion of Kaposi's sarcoma. In this

report, we describe a patient diagnosed with pulmonary Kaposi's sarcoma and treated with chemotherapy and cART successfully.

Case Report

A 28-year-old patient of men who have sex with men (MSM) rushed to the emergency department (ED) of our hospital due to chronic cough for 1 month. He had been suffering from chronic cough for 1 month, and bloody sputum was noted in these days. General body weakness and dyspnea on exertion (DOE) were progressive during this month.

Left-arm numbness, slurred speech, and headache drove the patient to our ED for further evaluation.

In the ED, the patient was alert with mild weakness, no fever, and with tachycardia (116/min), tachypnea (18/min), and blood pressure: 99/74 mmHg. Laboratory data revealed white blood cell (WBC): 3200 cells/ μ L, hemoglobin (Hb): 10.8 g/dL, platelet (PLT): 103,000/ μ L, C-reactive protein (CRP) <0.5 mg/dL, creatinine (Cr): 0.65 mg/dL, serum sodium (Na): 133 mmol/L, potassium (K): 3.7 mmol/L, and alanine aminotransferase (ALT): 50 IU/L. Chest roentgenography showed bilateral diffuse infiltration (Figure 1). Brain computed tomography (CT) showed no evidence of intracerebral hemorrhage (ICH).

Owing to the unusual pattern of lung infiltration, chest CT was performed, which revealed diffuse nodules at bilateral lung field (Figure 2). Under the tentative diagnosis of bilateral lung nodules, the patient was admitted for further evaluation.

After admission, CT-guided biopsy for chest nodules was performed. HIV-1 infection in AIDS status was confirmed during hospitalization (CD4 count: 27 cells/ μ L, plasma HIV RNA load: 694,746 copies/mL). Abacavir/dolutegravir/lamivudine

combination regimen (Triumeq) was administered for HIV infection, and the patient tolerated the treatment well. Sulfamethoxazole/trimethoprim combination regimen was administered empirically for treating pneumocystis jirovecii pneumonia (PJP).

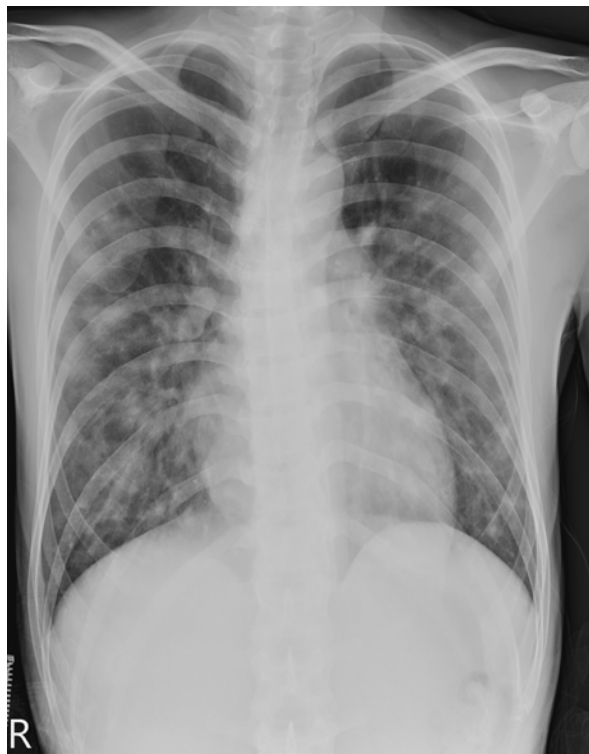


Figure 1. Chest *roentgenography* revealed infiltration of bilateral lung field on the day of admission.

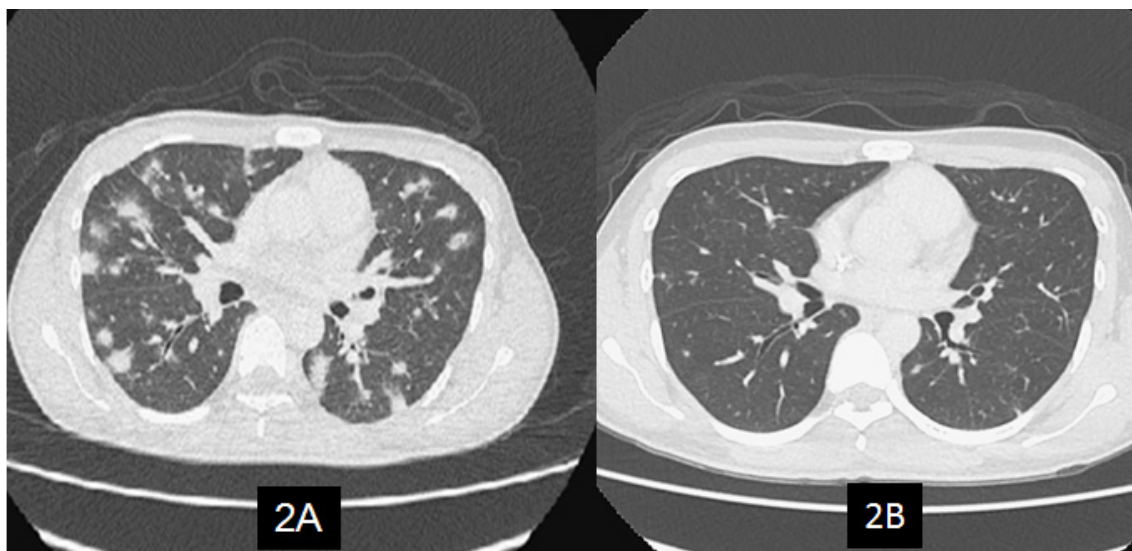


Figure 2. Chest computed tomography on the day of admission revealed diffuse nodules at bilateral lung field (A), while chest computed tomography performed after three courses of paclitaxel treatment revealed disappearance of nodules (B).

Examinations to determine the presence of other pathogens were performed, which revealed a *Treponema pallidum* (rapid plasma reagin [RPR]: 1:128; Treponemal chemiluminescence immunoassays [CIA]: 37.17), *Chlamydia pneumoniae* (*Chlamydia pneumoniae* IgM: positive) and oral *Candida* co-infection. Benzathine penicillin, levofloxacin, and fluconazole were administered accordingly.

Aspergillus and *Cryptococcus* antigens were checked, and both showed negative findings. Sputum acid-fast staining and mycobacterium culture also revealed negative findings. The lung biopsy samples revealed pulmonary Kaposi's sarcoma (Figure 3). A tiny spot of cutaneous violaceous lesion was found on the upper right arm after a thorough search. Port-a catheter was implanted, and chemotherapy with paclitaxel 200 mg/m² was administered. Grade 2 neutropenia (absolute neutrophil count [ANC]:1200) and fingertip numbness were found after treatment, which resolved spontaneously soon after detection. After the first dose of chemotherapy, hemoptysis and dyspnea were resolved. Then, the patient was discharged. Paclitaxel was administered biweekly for 2 more courses at the outpatient department (OPD). HIV infection status was followed up at infection OPD.

After finishing 3 courses of chemotherapy, the

patient continued follow-up at the OPD for 8 months; chest CT was performed, and no recurrence was found. At the time of writing this report, the patient was still visiting the OPD for ART and follow-up.

Discussion

Kaposi's sarcoma incidence declined in the post-highly active antiretroviral therapy (HAART) era. Kaposi's sarcoma was noted in 5.6% (326/5873) of HIV-infected patients in 1 series². Dhillon et al. revealed the presence of pulmonary Kaposi's sarcoma in 8.2% (25/305) of Kaposi's sarcoma patients³.

The pathophysiology of Kaposi's sarcoma is related to HHV-8. The virus infects endothelial cells and induces angiogenesis via vascular endothelial growth factor (VEGF) and forms angioproliferative tumor of Kaposi's sarcoma^{1,4}.

Pulmonary Kaposi's sarcoma is usually presented with chronic cough, dyspnea, and hemoptysis. Complications may include chylothorax, chylopericardium, diffuse alveolar hemorrhage, and immune reconstitution inflammatory syndrome (IRIS)⁵.

The imaging findings associated with pulmonary Kaposi's sarcoma range from bilateral infiltrates near the hila to discrete nodules in a characteristically peribronchial and perivascular fashion.

The definite diagnosis depends on the char-

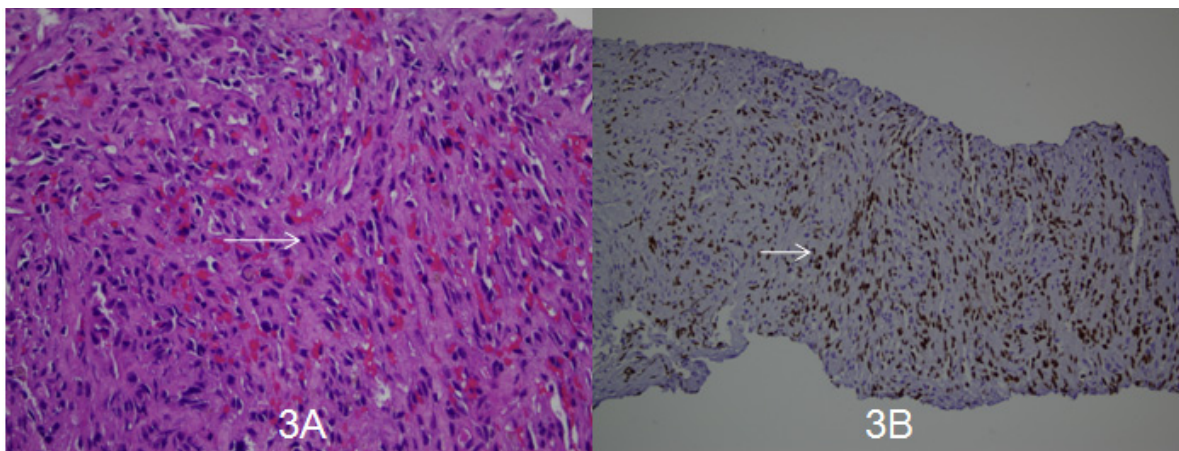


Figure 3. Spindle cells, indicated by an arrow, are the characteristic finding of Kaposi's sarcoma (A, hematoxylin and eosin staining, $\times 400$); HHV-8 in endothelium cells, indicated by an arrow, was localized via immunohistochemical staining (B, $\times 200$).

acteristic findings of spindle cell proliferation on pathology specimen, and immunohistochemical staining may reveal the presence of HHV-8.

Kaposi's sarcoma does not universally progress from mucocutaneous disease to visceral disease. In the case of our patient, the symptoms attributable to diffuse lung lesions made him come to hospital. However, only a small skin lesion was found.

Treatment option is different and depends upon disease severity. Mild cutaneous Kaposi's sarcoma may use ART alone. According to Arruda et al., patients with pulmonary involvement, symptomatic visceral lesions, lymphedema secondary to Kaposi's sarcoma, rapidly progressive skin disease, or with IRIS are indicated for chemotherapy combined with ART⁶.

The choice of chemotherapy regimen includes paclitaxel or pegylated liposomal doxorubicin. According to the clinical trial conducted by National Institutes of Health in the USA, the effects of both regimens (paclitaxel 100 mg/m² versus pegylated liposomal doxorubicin 20 mg/m²) are comparable in terms of median progression-free survival and 2-year survival⁷.

Different dosages and schedules of paclitaxel have been used. It ranges from low dose (100 mg/m²) every 2 weeks to high dose (135–175 mg/m²) every 3 weeks⁸. In comparison, an intensified regimen with paclitaxel 200 mg/m² for every 2 weeks was used in this patient.

Conclusion

Although the rate of Kaposi's sarcoma is declining in the post-HAART era, it can still be seen in delayed-diagnosis patients with a low CD4 count.

Pulmonary Kaposi's sarcoma may occur without evident skin involvement. Invasive procedures are needed for early diagnosis of these patients. Chemotherapy with ART may prolong the overall survival for pulmonary Kaposi's sarcoma patients. In this case, paclitaxel with the dosage of 200 mg/m² every 2 weeks for 3 times yielded an excellent outcome.

Note

None of the authors has any potential financial conflicts of interest.

References

1. Mesri EA. Inflammatory reactivation and angiogenicity of Kaposi's sarcoma-associated herpesvirus/HHV-8: a missing link in the pathogenesis of acquired immunodeficiency syndrome-associated Kaposi's sarcoma. *Blood* 1999; 93: 4031-3.
2. Stebbing J, Sanitt A, Nelson M, et al. Prognostic index for AIDS-associated Kaposi's sarcoma in the era of highly active antiretroviral therapy. *Lancet* 2006; 367: 1495-502.
3. Palmieri C, Dhillon T, Thirlwell C, et al. Pulmonary Kaposi's sarcoma in the era of highly active antiretroviral therapy. *HIV Medicine* 2006; 7: 291-3.
4. Imran TF, Al-Khateeb Z, Jung Jin, et al. Pulmonary Kaposi's sarcoma as the initial presentation of human immunodeficiency virus infection. *IDcases* 2014; 1: 78-81.
5. Epelbaum O, Go R, Patel G, et al. Pulmonary Kaposi's sarcoma and its complications in the HAART era: a contemporary case-bases review. *Lung* 2016; 194: 163-9.
6. Arruda E, Jacome AA, Toscano AL, et al. Consensus of Brazilian society of infectious diseases and Brazilian society of clinical oncology on the management and treatment of Kaposi's sarcoma. *Braz J Infect Dis* 2014; 18: 315-26.
7. Cianfrocca M, Lee S, Roenn JV, et al. Randomised trial of paclitaxel versus pegylated liposomal doxorubicin for advanced human immunodeficiency virus-associated Kaposi's sarcoma: evidence for symptom palliation from chemotherapy. *Cancer* 2010; 116: 3969-77.
8. Dongre A, Montaldo C. Kaposi's sarcoma in an HIV-positive person successfully treated with paclitaxel. *Indian J Dermatol Venereol Leprol* 2009; 75: 290-2.

肺部卡波西氏肉瘤發生在人類免疫缺乏病毒感染患者 身上一成功以紫杉醇治療

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摘 要

我們在此報告一位罹患肺部卡波西氏肉瘤的愛滋病患者，經診斷後以較高劑量(200 mg/m²)的紫杉醇治療，兩周一次共治療三次後痊癒，經追蹤沒有復發的個案報告。