Pulmonary Kaposi’s Sarcoma Mimicking Acute Bacterial Pneumonia in an HIV-infected Man

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ABSTRACT

The authors presented a case of HIV infection presenting with disseminated Kaposi’s sarcoma (KS) including pulmonary involvement that mimicked respiratory tract infections. The patient was a 19-year-old man with homosexual risk and had a history of *Pneumocystis jiroveci* pneumonia 4 months earlier. Later, he developed progressive violaceous plaques on skin and oral mucosa, and bilateral cervical lymphadenopathy. He was admitted to the hospital because of fever and progressive dyspnea. Chest radiograph showed bilateral reticulonodular infiltrations. Acute bacterial pneumonia was diagnosed and he was treated with antibiotics empirically. Biopsy of the skin lesions was performed and revealed KS pathologically. Pulmonary KS was diagnosed and antibiotics were discontinued. The patient received antiretroviral therapy (ART) and pacitaxel. Then, he gradually had a significant clinical improvement. Therefore, pulmonary KS should be considered in HIV-infected patients with mucocutaneous KS presenting with respiratory symptoms. Early aggressive treatment with ART and chemotherapy yield a good outcome. *(J Infect Dis Antimicrob Agents 2011;28:53-8.)*

Note: This case had been presented and discussed in the Interhospital Case Conference on Infectious Diseases (ICCID), 7 October 2010, Phetchaburi, Thailand.

INTRODUCTION

Kaposi’s sarcoma (KS) is a mesenchymal angio-proliferative tumor involving blood and lymphatic vessels. It is the most common tumor among patients with human immunodeficiency virus (HIV) infection, especially homosexual or bisexual men.1-5 It usually presents as mucocutaneous lesions and can involve visceral organs such as lungs and gastrointestinal tract which is commonly life threatening. Pulmonary involvement of KS is a grave illness in patients with acquired immunodeficiency syndrome (AIDS) and it may be difficult to differentiate from other infectious or neoplastic conditions.6-9
We reported an AIDS patient with pulmonary KS, who presented as acute pneumonia initially. He responded successfully to the treatment with antiretroviral therapy (ART) and chemotherapy. We emphasize an importance of early diagnosis and aggressive therapy for a good prognosis.

CASE REPORT

Sixteen weeks before this admission, a 19-year-old Thai homosexual man presented with a 2-week history of fever, cough, and progressive dyspnea. Chest radiograph showed areas of ground-glass opacity in both lung fields. Anti-HIV antibody test was reactive. AIDS with *Pneumocystis jiroveci* pneumonia (PCP) was diagnosed and he responded satisfactorily to co-trimoxazole therapy. After the treatment course of PCP, he developed skin rashes related to co-trimoxazole, thus he did not receive the secondary prevention for PCP. However, he received ART with the regimen including stavudine, lamivudine, and efavirenz. Initial CD4 cell count was 2 cells/mm$^3$.

Ten weeks prior to this admission, he developed progressive erythematous to violaceous plaques on his right malar region and left arm which gradually extended to the surrounding areas. He also had new violaceous plaques in oral cavity, especially at soft palate.

Two weeks prior to this admission, all violaceous lesions increased in number and size. One week later, he developed bilateral cervical lymphadenopathy, low-graded fever, and progressive dyspnea. ART was discontinued because drug hypersensitivity could not be ruled out.

On admission at Srinagarind Hospital, his vital signs were as the following: body temperature 37.9$^\circ$C, blood pressure 101/63 mmHg, pulse rate 72/min, and respiratory rate 26/min. Multiple cervical lymph nodes (0.5-3 cm in diameter) were palpated on both sides. Chest physical examination revealed bronchial breath sounds, fine crepitation, increased vocal resonance, and dullness on percussion at right lung field. Violaceous papules and plaques at right malar region, left arm, and oral cavity were noted (Figure 1 and 2). Otherwise were unremarkable.

Complete blood count showed as the following; hemoglobin 13.0 g/dL, white blood cell count 5.5 x 10$^5$/L (neutrophils 62.7%, lymphocytes 20.1%, and monocytes 11%, others 6.2%), and platelet count 218,000 cells/mm$^3$. Urinary examination showed albuminuria 1+. Renal function and electrolytes were within normal range. Liver function tests revealed alanine transaminase 130 U/L, aspartate transaminase 99 U/L, alkaline phosphatase 210 U/L. Serum lactate dehydrogenase concentration was 318 U/L. His chest radiograph showed inhomogeneous patchy infiltrations at right lung and bilateral interstitial infiltrations (Figure 3). Oxygen saturation value at room air was 88 percent by pulse oximetry.

Fine needle aspiration of cervical lymph node revealed no organism. Sputum examinations were negative on acid-fast stain, Gram stain, and Wright’s stain. Initially, severe community-acquired pneumonia could not ruled out. Therefore, empirical antibiotic therapy with intravenous ceftriaxone 2 g per day, gentamicin 3 mg per kg per day, plus oral azithromycin 500 mg per day were given but he was clinically not improved. He underwent skin biopsy of the lesion at his left arm and the pathological finding showed interwoven bands of spindle cells and vascular structures grouped in a network of reticular and collagen fibers (Figure 4). Erythrocytes were seen within these vascular structures and interspersed between spindle cells (Figure 5). The findings were compatible with KS. Antibiotics were discontinued. ART was re-started with a regimen of tenofovir,
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Figure 1. Skin lesion at malar region

Figure 2. Mucosal lesions in oral cavity

Figure 3. Chest radiograph on admission

Figure 4. Pathological findings at 400x magnification

Figure 5. Pathological findings at 1,000x magnification
Figure 6. Chest radiograph 1 week post-chemotherapy

lamivudine, lopinavir/ritonavir. Furthermore, he also received paclitaxel 100 mg per m^2. After treatment, the patient showed a significant clinical improvement and chest radiograph showed markedly resolution of infiltration (Figure 6) (2 weeks after ART and 1 week after chemotherapy). He was doing well and KS mucocutaneous lesions as well as pulmonary infiltrates disappeared after 6 courses of pacitaxel.

DISCUSSION

In the presented case, we demonstrated a pulmonary manifestation of KS that mimicked acute bacterial pneumonia. Skin manifestation was an important diagnostic clue and guided to early chemotherapy for this patient. We made the presumptive diagnosis of pulmonary KS by the evidence of concurrent mucocutaneous KS and non-responsive pulmonary infiltrates after empirical antibiotics. Although bronchoscopic findings of typical endobronchial lesions of KS is helpful\(^\text{10}\), however it has a low diagnostic yield\(^\text{8}\) and is difficult to be performed even in the tertiary care center in Thailand.

KS most commonly occurs in AIDS patients and 90-95 percent of cases occurred in homosexual men or bisexual men.\(^\text{1,5}\) It is one of the AIDS-defining illnesses and one of the most common AIDS-related malignancies even in the era of highly active antiretroviral therapy (HAART) although the incidence dramatically declines.\(^\text{3-5}\)

Human herpesvirus (HHV)-8 is believed the etiologic agent.\(^\text{11}\) The pathogenesis of HIV-associated KS (HIV-KS) is complex and involves an interaction between HHV-8 and HIV. HHV-8 may induce inflammation, angiogenesis, and oncogenesis in conjunction with profound immunosuppression from HIV itself.\(^\text{11}\) The initial lesion starts as a reactive hyperplasia and eventually progresses to a true neoplasia. The inflammatory cells in HIV-KS lesions which comprise CD8+ T cells, monocytes, macrophages, and dendritic cells produce inflammatory cytokines that together with HHV-8 gene products activate endothelial cells and trigger the development of HIV-KS.

Pulmonary involvement of KS has been reported around 6-32 percent of AIDS patients with cutaneous disease by fiberoptic bronchoscopy and in 47-75 percent of these patients at post mortem.\(^\text{8}\) Most of them have low CD4 cell count usually less than 100/\(\text{mm}^3\).\(^\text{8,12}\) The manifestations include parynchymal, pleural, mediastinal, and chest wall abnormalities. Common presenting symptoms are fever, chronic cough, dyspnea, and hemoptyisis.\(^\text{7,8}\)

The plain chest radiograph of pulmonary KS lesion initially reveals bronchovascular thickening often originating from perihilar area. Then, a reticulonodular infiltrate appears, mainly in the lower lobes and may progress to dense airspace consolidation.\(^\text{7,8,13,14}\) Pleural effusions are present in as many as 50 percent of cases, and hilar or mediastinal lymphadenopathy is also found in 10 to 16 percent.\(^\text{7,8,13,14}\) High resolution computerize tomography scan of chest may reveal more details of infiltrates and nodules.\(^\text{13,15}\)

In the past, the prognosis of KS is poor with chemotherapy alone, with a median survival after
diagnosis of 4-10 months. Pulmonary KS also results in poor prognosis, with the median survival following diagnosis in the pre-HAART era was 3-10 months. Poor prognosis relates to respiratory complications such as upper airway obstruction, pulmonary hemorrhage, and concomitant infection.

The use of ART has resulted in a dramatic reduction in the morbidity and mortality in HIV-infected patients as well as those with KS including pulmonary KS. Treatment of KS varies according to extent of mucocutaneous lesions and visceral organ involvement. Mucocutaneous lesions may regress or disappear by ART only and the likelihood of developing new lesions of KS is diminished. This can be attributed to 3 factors. Firstly, the reduction in HIV load results in decreasing transactivating factor (Tat) protein and inflammatory cytokines. Secondly, HHV-8 specific–CD8+ specific T lymphocyte response is improved following ART and therefore there is a reduction in HHV-8 load. Thirdly, some protease inhibitors (PI) have anti-inflammatory and anti-angiogenic activity, thus directly inhibiting HIV-KS. However, visceral involvement usually needs chemotherapy which pacitaxel and pegylated liposomal doxorubicin showed the satisfactory result. In the present case, after treatments with PI-based ART and paclitaxel, the patient had marked improvements in both mucocutaneous lesions and radiologic findings.

In summary, we reported a case of disseminated KS including pulmonary involvement that mimic acute bacterial pneumonia. The pulmonary KS should be considered when patients have respiratory symptoms with dermatologic manifestations of KS. Pneumonia should be excluded as soon as possible therefore the chemotherapy can be started early. In conjunction with ART, the outcome of treatment is satisfactory and may be curative.

References


