

## A Case of Pulmonary Kaposi's Sarcoma in a Patient with Renal Transplantation : High Resolution CT Findings<sup>1</sup>

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Kaposi's sarcoma accounts for more than 3% of neoplasms occurring in patients who have undergone a transplant. An epidemiologic study showed that in renal transplanted patients, the incidence of Kaposi's sarcoma was 400 to 500 times higher than in controls of the same ethnic origin. We report a case of Kaposi's sarcoma involving the lung and skin after immunosuppressive therapy in a patient with renal transplant. A plain chest radiograph showed diffusely increased interstitial opacity with multiple, ill-defined small nodules in both lung fields. HRCT revealed multiple small nodules, predominantly in the peribronchovascular regions, and ill-defined areas of ground-glass opacity and consolidation in both lungs.

**Index words :** Lung neoplasms, CT  
Kaposi sarcoma

Kaposi's sarcoma is the most common neoplasm affecting patients with acquired immunodeficiency syndrome (AIDS) and occurs in 10-20% of all AIDS patients; it may also occur in organ transplanted recipient who undergo prolonged or intensive immunosuppressive therapy(1). The radiologic manifestations of AIDS-related pulmonary Kaposi's sarcoma have been reported(2-4). Though high-resolution computed tomography (HRCT) findings of pulmonary Kaposi's sarcoma after renal transplantation.

We report chest radiographic and high resolution computed tomographic findings in a case of Kaposi's sarcoma involving the lung and skin after immunosuppressive therapy in a renal transplant patient.

### Case Report

A 31-year-old man was admitted to hospital with a two-week history of cough, dyspnea, mild fever, hemoptysis, and the presence of numerous skin lesions on the legs. Five years ago, a kidney transplant had been performed, and he had been treated with prednisone (30mg daily) and cyclosporin A(maintenance dose, 200mg daily). Because of chronic rejection, OKT3 (Muromonab CD 3, 5mg daily) had recently been administered. Blood chemistry showed that blood urea nitrogen and creatinine levels were 29.5mg/dl and 2.5mg/dl respectively. Serologic tests for human immunodeficiency virus and cytomegalovirus were negative. On physical examination, a coarse breathing sound was heard, with rhonchus and rale throughout the chest. Multiple small nodules and plaques, some ulcerated and purplish were found on both legs. A plain chest radiograph showed diffusely increased interstitial opacity with multiple, ill-defined small nodules in both lung fields(Fig. 1A).

HRCT demonstrated multiple small nodules, predominantly in the peribronchovascular and subpleural regions, and ill-defined areas of ground-glass opacity

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Received November 17, 1998; Accepted January 9, 1998

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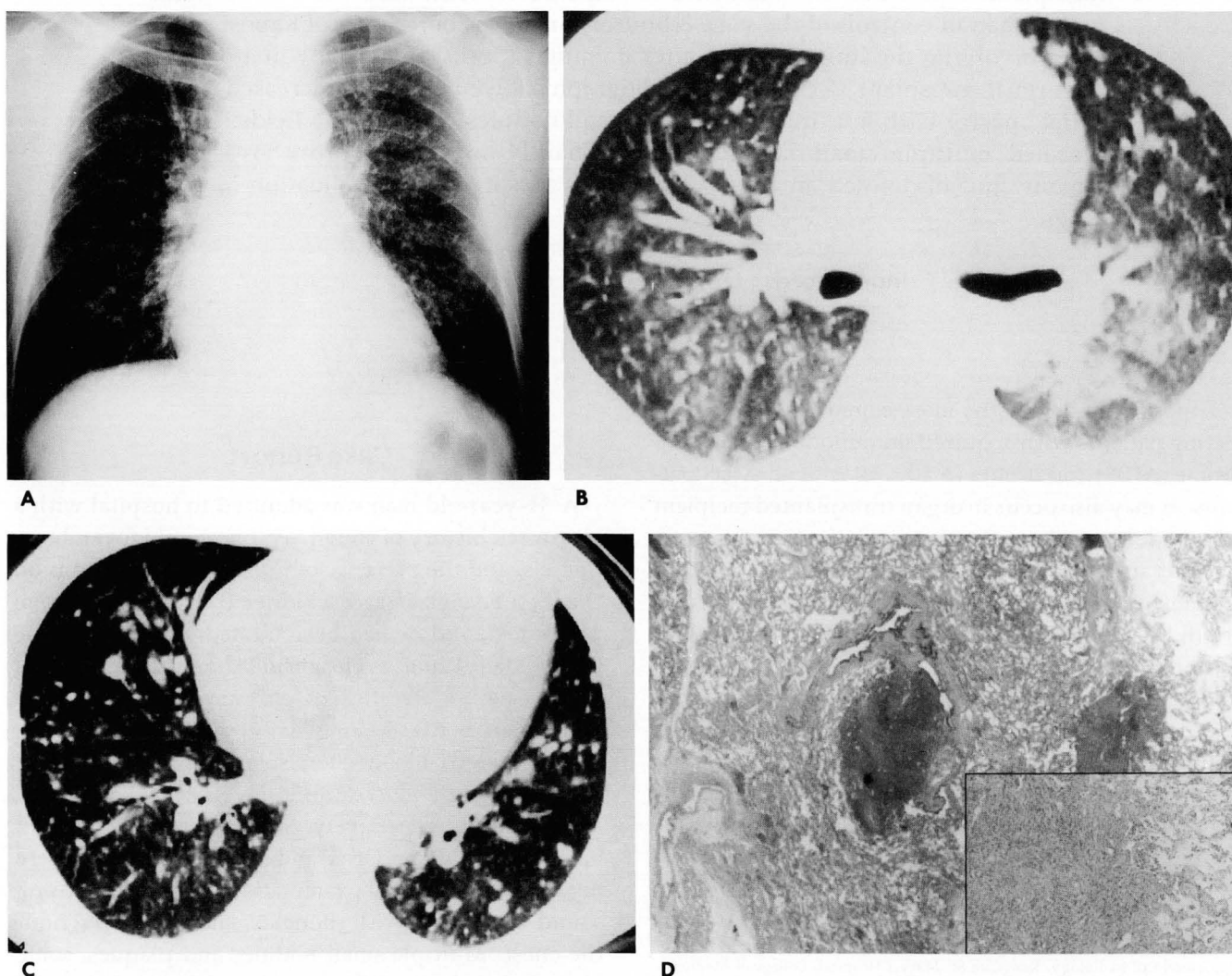
and consolidation in both lungs(Fig. 1B & C). Neither definite pleural effusion nor mediastinal lymph node enlargement was seen, and bronchoscopy revealed no endobronchial lesion.

Specimens of open lung biopsy showed multiple rubbery nodules up to 3mm in size, along the bronchovascular bundles as well as foci of multifocal intraalveolar hemorrhagic. Microscopically several relatively well demarcated solid nodules were seen in the lung tissue. They showed the typical features of Kaposi's sarcoma, including spindle cell proliferation with endothelial-lined vascular slits and many extrav-

asated erythrocytes(Fig. 1D). In situ hybridization for cytomegalovirus and Epstein-barr virus was negative. But skin biopsy also indicated early stage Kaposi's sarcoma.

## Discussion

Kaposi's sarcoma is a multifocal tumor characterized by proliferation of endothelial and spindle cells. Its nature is disputed, it might not be a true neoplasm but rather a proliferative reaction to abnormal growth factors(5). There are four types: the classic sporadic



**Fig. 1.** 31-year-old man with pulmonary Kaposi's sarcoma.

**A.** Chest radiograph shows diffusely increased interstitial opacities with multiple, ill-defined small nodules in both lung fields.

**B-C.** HRCT scans of the chest at the levels of middle (**B**) and lower (**C**) lung field demonstrate multiple small nodules that predominate in the peribronchovascular regions, peribronchovascular interstitial thickening, and ill-defined areas of consolidation and ground-glass opacities.

**D.** Light microscopic examination of the lung reveals several solid tumor nodules along the bronchovascular bundles(H & E, ×40). The inlet (right lower corner) shows typical features of Kaposi's sarcoma such as spindle cell proliferation with intervening vascular slits and many extravasated erythrocytes(H & E, ×100).

form, African endemic form, post-transplantation form with immunosuppression, and the AIDS related form (6).

Kaposi's sarcoma accounts for more than 3% of neoplasms occurring in transplant patients and an epidemiologic study showed that in renal transplant patients, its incidence was 400 to 500 times higher than in controls of the same ethnic origin(7). Penn (1) enumerated several factors which might induce tumors after organ transplant; these were disturbance of immunity, oncogenic viruses, the oncogenic effect of immunosuppressive agents, variations in the individual's susceptibility, and chronic antigen stimulation.

Pulmonary Kaposi's sarcoma, which occurs in 18-47% of patients with known cutaneous Kaposi's sarcoma, affects the tracheobronchial tree, lung parenchyma or pleura individually or in combination (8-10). The presence of cutaneous Kaposi's sarcoma is an important pointer to the possibility of lung involvement, and pulmonary Kaposi's sarcoma is rare in the absence of cutaneous Kaposi's sarcoma(8). Another clinical pointer is the occurrence of hemoptysis. Involvement of the tracheobronchial tree in Kaposi's sarcoma is relatively frequent, and the lesions are highly vascular(9).

Grossly and microscopically, the lesions of Kaposi's sarcoma are hemorrhagic nodules found along the lymphatic routes(9). Mural infiltration of vessels and airways is common. Histologically, there is a proliferation of spindle cells with intercellular clefts, extravasation of red blood cells, scattered hemosiderin, cytoplasmic eosinophilic bodies, ectasia of surrounding vascular spaces, and prominent plasma cells in surrounding tissues. Early cases may manifest as peribronchial or perivascular fibrous tissue thickened with increased spindle cells, hemosiderin, and plasma cells(9).

Chest radiographs typically show bilateral and diffuse abnormalities characterized by the presence of interstitial opacities that are predominantly peribronchovascular, poorly defined nodules which can be several centimeters in diameter, and ill-defined areas of consolidation. Pleural involvement is common and effusions are usually bilateral and may be large. In some series, hilar and mediastinal adenopathy has been detected in 25 to 60% of cases(2-4). Naidich and associates (2) suggested that CT scanning, while not definitive, may be sufficiently characteristic to strongly suggest a diagnosis of Kaposi's sarcoma. Typical HRCT findings include irregular and ill-defined nodules that often predominate in the peribronchovascular regions, peribronchovascular interstitial thickening, interlob-

ular septal thickening, pleural effusion, and lymphadenopathy in AIDS. An interesting finding is the relatively high CT attenuation of Kaposi's nodules on dynamic scans following a bolus injection of intravenous contrast medium(3). This high attenuation is thought to reflect the pronounced hypervascularity of Kaposi's sarcoma and was found in 80% of cases in this series(3). Khalil reported that scattered ground-glass opacity was found in three of 53 cases; in two cases it was associated with intra-alveolar hemorrhage(4). In our case, the patient presented with hemoptysis and HRCT revealed multifocal ground-glass opacity which pathologically, correlated with intra-alveolar hemorrhage.

If Kaposi's sarcoma develops, it usually becomes evident 14-34 months after a transplant. The behavior of the tumor is different in transplant patients than in those suffering from Kaposi's sarcoma of the classic type or from AIDS patients. The level of immune deficiency appears to play a role(10). In patients undergoing immunosuppressive therapy, lymph node involvement is rare, visceral disease is less common, and fatalities resulting from Kaposi's sarcoma are less frequent. In our case, the pulmonary nodules were smaller, mainly less than 1 cm in diameter, and relatively well defined, as compared to AIDS related Kaposi's sarcoma. Mediastinal lymph node involvement and pleural effusion were not associated. The main finding in our case was ground-glass opacity representing intra-alveolar hemorrhage.

Although HRCT findings are not pathognomonic, HRCT findings of peribronchovascular and subpleural lesion, and combined skin lesion, are helpful diagnostic indicators of Kaposi's sarcoma in an immunosuppressed patient.

## References

1. Penn I. Tumors after renal and cardiac transplantation. *Hematol Oncol Clin North Am* 1993; 7(2): 431-445
2. Naidich DP, Tarras M, Garay SM, Birnbaum B, Rybak BJ, Schinella R. Kaposi's sarcoma: CT-radiographic correlation. *Chest* 1989; 96: 723-728
3. Herts BR, Megibon AJ, Birnbaum BA, et al. High attenuation lymphadenopathy in AIDS patients: significance of findings at CT. *Radiology* 1992; 185: 777-781
4. Khalil AM, Carette MF, Cadranel JL, Mayaud CM, Bigot JM. Intrathoracic Kaposi's sarcoma: CT findings. *Chest* 1995; 180: 1622-1626
5. Ensoli B, Nakamura S, Salahuddin SZ, et al. AIDS-Kaposi's sarcoma-derived cells express cytokines with autocrine and paracrine growth effects. *Science* 1989; 243: 223-226
6. Kato N, Harada M, Yamashiro K. Kaposi's sarcoma associated with lung cancer and immunosuppression. *J Dermatol* 1996; 23: 564-571

7. Harwood AR, Osoba D, Hofstader SL, et al. Kaposi's sarcoma in recipients of renal transplants. *Am J Med* 1979 ; 67 : 759-765
8. Lemlick G, Schwam L, Lebwohl M. Kaposi's sarcoma and acquired immunodeficiency syndrome : postmortem findings in twenty-four cases. *J Am Acad Dermatol* 1987 ; 16 : 319-325
9. Colby TV, Koss MN, Travis WD. *Tumors of the lower respiratory tract, atlas of tumor pathology*. AFIP, Washington D.C., 1994 : 372-374
10. Abel EA. Cutaneous manifestations of immunosuppression in organ transplant recipients. *J Am Acad Dermatol* 1989 ; 21(2) : 167-179

대한방사선의학회지 1998 ; 38 : 473-476

## 신이식환자에서 발생한 폐의 Kaposi 육종 1예 보고<sup>1</sup>

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폐의 Kaposi 육종은 매우 드문 질환으로 AIDS 환자에서 주로 발생하나 장기이식후 면역억제제를 장기간, 다량 사용하는 경우에도 생길수 있다. 저자들은 신이식후 거부증을 일으킨 환자에서 면역억제요법후 폐에 발생한 Kaposi 육종 1예를 고해상 전산화단층촬영 소견을 중심으로 보고한다. 병변은 단순흉부촬영상 양측 폐야에 간질이 증가되었으며 수많은 작은 결절들이 동반되었다. 고해상 전산화단층촬영 영상에서 많은 작은 폐결절들이 기관지-혈관주위에 분포하였고 경계가 불분명한 마쇄유리상 음영들이 동반되었다.