

# A CASE OF CAVITATING PNEUMONIA IN AIDS

P Eng, D Allen, S K Chew, E Monteiro, C S Sim

## ABSTRACT

*Tuberculosis is a common cause of cavitating pneumonia in Singapore. In patients with the human immunodeficiency virus (HIV), cavitary pneumonias mimicking tuberculosis can mislead the clinician, delaying diagnosis, resulting in increased morbidity. We describe a HIV seropositive patient with cavitating pneumonia in whom the diagnosis of *Pneumocystis carinii* pneumonia (PCP) was ultimately established only on bronchoscopy.*

**Keywords :** *Pneumocystis carinii pneumonia (PCP), tuberculosis, human immunodeficiency virus (HIV), acquired immunodeficiency syndrome (AIDS), bronchoscopic alveolar lavage (BAL), transbronchial lung biopsy (TBLB).*

SINGAPORE MED J 1992; Vol 33: 409-410

## INTRODUCTION

The world's first description of the acquired immunodeficiency syndrome (AIDS) appeared in 1981. Singapore reported its first case of AIDS in 1985<sup>(1)</sup>. As of 31 May 1991, there have been seventy-seven reported cases of patients tested seropositive for the human immunodeficiency virus (HIV) in Singapore. Of these, about thirty have progressed to develop AIDS. AIDS is defined as the presence of an AIDS-defining illness as a consequence of severe immunosuppression due to the HIV virus<sup>(2)</sup>.

Worldwide, the most frequent AIDS-defining illness is the *Pneumocystis carinii* pneumonia (PCP). Our experience has supported this observation since we began routine bronchoscopy as part of the evaluation for HIV patients with pulmonary complaints at the Communicable Disease Centre (CDC) in Singapore. This is because different opportunistic infections or tumours may present similarly as pulmonary processes in HIV infected individuals. Therapy for the different types of pulmonary processes in HIV infected individuals is quite diverse (and often toxic), hence necessitating a definitive

diagnosis to be made before treatment. Understanding the limitations of the history, physical examination and radiography in establishing this diagnosis is the first step towards appreciating the need for aggressive efforts to confirm the diagnosis. We describe here an atypical presentation of PCP which was initially mistaken for tuberculosis.

## CASE REPORT

ABC, a 30-year-old unmarried heterosexual Chinese male, working as a technician, was admitted to Tan Tock Seng Hospital in February 1991. His chief complaints then were productive cough for three months, loss of weight (five kilograms over four months) and breathlessness for three days. His past history was unremarkable and there was no recollection of tuberculosis exposure. He reported heterosexual genital-genital contact overseas a year ago. The clinical examination was notable only for a low grade fever and resting tachypnea. Auscultation of the lungs was unremarkable. Investigations were as follows: haemoglobin 10.2g/dl, leukocyte count 3300/ml P69% L28% M2% E1%, serum electrolytes normal, arterial blood gases on air pH 7.489 pO<sub>2</sub> 77.8mmHg pCO<sub>2</sub> 30.1mmHg. A chest radiograph revealed a consolidation in the apical segment of the right lower lobe with a 3 X 2 cm cavity (Fig 1). Sputum smear was positive for acid fast bacilli in one out of two samples (I+) and blood cultures were negative for aerobic and anaerobic bacteria. Mantoux test was zero at 24 and 48 hours. A Western Blot test for HIV antibodies was positive. Absolute CD4 lymphocyte count was 80/mm<sup>3</sup> (Normal >500/mm<sup>3</sup>). Both bronchoalveolar lavage (BAL) and transbronchial lung biopsy (TBLB) performed at bronchoscopy yielded cysts diagnostic of *pneumocystis carinii* (Fig 2 and 3). Sputum cultures for acid fast bacilli were negative.

He was initially started on both trimethoprim/sulfamethoxazole (TMP/SMZ) and antituberculous chemotherapy but the latter was discontinued after histology of BAL fluid and TBLB were confirmed to be negative for tuberculosis (ie about two weeks). Patient remained febrile despite seven days of TMP/SMZ and was converted to intravenous pentamidine isethionate (alternative therapy for PCP), following which his symptoms resolved. The patient is currently well and maintained on Zidovudine (AZT) and monthly aerosolised pentamidine.

## DISCUSSION

PCP is the most common pulmonary complication associated with HIV infection. It is estimated that some 80% of patients with HIV will develop PCP during the course of their disease<sup>(3)</sup>. The classic radiological presentation is that of a diffuse reticular infiltrate emanating from the hila. However, various other presentations have been described, including focal granulomas, cavitation and even a normal chest radiograph<sup>(4-7)</sup>. In Singapore, the authors have confirmed ten cases of HIV-related PCP via bronchoscopy. ABC is the first patient of this

Department of Medicine II  
Tan Tock Seng Hospital  
Moulmein Road  
Singapore 1130

P Eng, MBBS, M Med (Int Med)  
Registrar

Communicable Disease Centre  
Tan Tock Seng Hospital

S K Chew, MBBS, MSc (Public Health)  
Registrar

E Monteiro, MBBS  
Head

Department of Medicine III  
Singapore General Hospital  
Outram road  
Singapore 0316

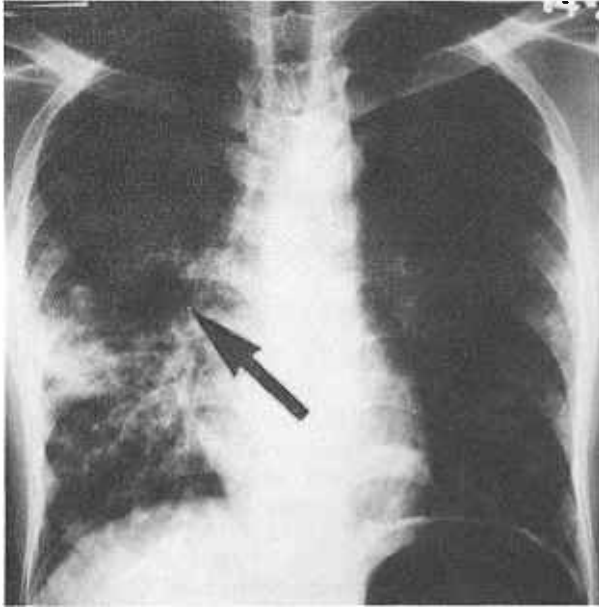
D Allen, MD, ABIM (Int Med & Inf Dis)  
Consultant

Department of Pathology  
Singapore General Hospital

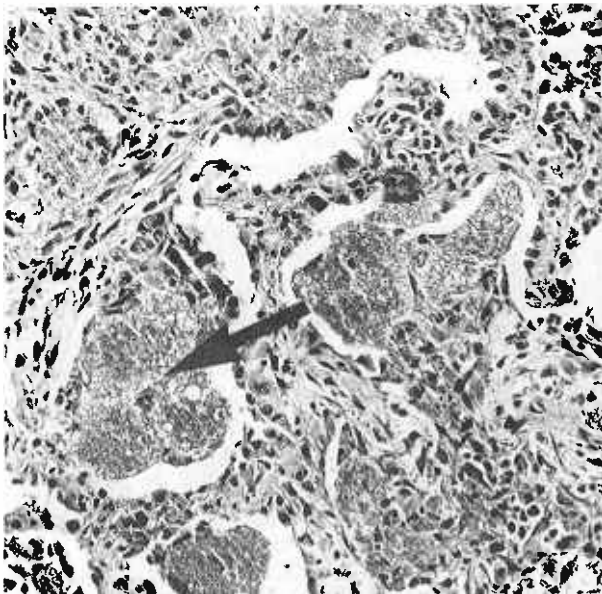
C S Sim, MBBS, FRCPA  
Senior Registrar

Correspondence to: Dr P Eng

**Fig 1 - Chest X-ray of the patient showing a 3 X 2 cm cavity in the apical segment of the right lower lobe.**



**Fig 2 - Cyst of Pneumocystis carinii in transbronchial lung biopsy.**

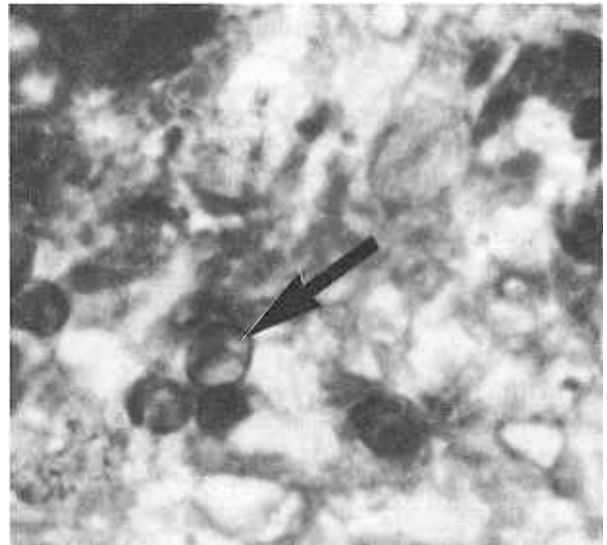


group to present with pulmonary cavities.

In the HIV infected patient with cavities on the chest radiograph, the differential diagnosis is quite diverse and includes *Mycobacterium tuberculosis*, *Mycobacterium avium-intracellulare*, pyogenic bacteria, fungi, lymphomas and Kaposi's sarcoma as well as PCP. In spite of a solitary sputum smear showing acid fast bacilli, several features were against the diagnosis of tuberculosis in our patient:

- 1) *Negative Mantoux reading*  
This result suggests either no prior exposure to tuberculosis or dysfunction of cell-mediated immunity. Despite the profound alteration of T-cell function in HIV, >50% with active tuberculosis have >10mm induration following the Mantoux.
- 2) *Absence of hilar and/or mediastinal lymphadenopathy*  
Adenopathy is commonly found in HIV-related pulmonary tuberculosis, but is not seen in PCP<sup>(8)</sup>.
- 3) *Response to pentamidine isethionate.*

**Fig 3 - Spherules or cyst of Pneumocystis Carinii (H & E, oil immersion, magnified X1000)**



Pentamidine's activity is limited to PCP, *Trypanosoma* spp and *Leishmania* spp<sup>(3)</sup>.

- 4) Negative sputum and blood cultures and BAL/TBLB specimens.

The diagnosis of the etiology of pulmonary infiltrates in HIV infected patients has evolved rapidly over the last few years. Open lung biopsy, while being the gold standard for diagnosis of pulmonary involvement in AIDS is presently considered unnecessary and accompanied by significant morbidity and mortality<sup>(3)</sup>. With regards to BAL and TBLB combined, the sensitivity for detecting PCP has been reported to be 95-100% and >85% for acid fast bacilli<sup>(9)</sup>. Some centres have reported up to 55% success in diagnosing PCP using expectorated sputum following hypertonic saline<sup>(10)</sup>. Our limited experience with induced sputum has not been encouraging. Hence, we have elected to use the bronchoscope early as part of our protocol in evaluating such patients with the aim of limiting potentially toxic empiric therapy and developing an epidemiological database for the types of pulmonary complications in HIV infected patients.

#### CONCLUSION

Experience gained with the case presented has reinforced our current understanding of HIV-related pulmonary disease. This case has illustrated the following:

- 1) In a HIV seropositive patient, PCP can cause a cavitory pneumonia, mimicking tuberculosis.
- 2) Bronchoscopy can be used to obtain a definite diagnosis of PCP infection.

#### REFERENCES

1. Chew SK, Monteiro EHA. The Acquired Immunodeficiency Syndrome in Singapore-Epidemiological Perspectives. *Singapore Med J* 1989;30:28-31.
2. Revision of the CDC Surveillance Case Definition for AIDS. *AIDS Program CDC Atlanta* 1987;36.
3. Murray JF, Mills J. Pulmonary infectious complications of HIV infection. *Am Rev Respir Dis* 1990;141:1356-72.
4. Kovacs JA. Diagnosis, treatment and prevention of PCP in HIV infected patients. *AIDS Update* 1989;2:1-12.
5. Levine SJ, White DA. PCP. *Clinical Chest Med* 1988;9:395 - 423
6. Hopewell PC, Luce JM. Pulmonary involvement in AIDS. *Chest* 1985;87:104-12.
7. Cohen BA, Pomeranz S, Rabinowitz JG et al. Pulmonary complications of AIDS-Radiological features. *AJR* 1984;143: 115-22.
8. Ellner JJ. Tuberculosis in the time of AIDS. *Chest* 1990;98:1051-2.
9. Broadus C, Dake MD, Stulbarg MS. Bronchoalveolar lavage and transbronchial biopsy for the diagnosis of pulmonary infections in AIDS. *Ann Intern Med* 1985;102:747-52.
10. Bigby TD, Margolskee D, Curtis JL. The usefulness of induced sputum in the diagnosis of PCP in patients with AIDS. *Am Rev Respir Dis* 1986;133:226-9.