Short reports

Pneumocystis carinii pneumonia presenting with pneumomediastinum in an HIV-positive patient

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Summary

A 19-year-old man presented with community-acquired pneumonia, complicated by pneumomediastinum. Subsequently he was found to be HIV-positive, and to have *Pneumocystis carinii* pneumonia.

Keywords: *Pneumocystis carinii*, Pneumomediastinum, HIV disease

Introduction

Pneumomediastinum without pneumothorax is an unusual, though well-documented, complication of a variety of medical and surgical conditions.¹ We report the case of a patient with pneumomediastinum without pneumothorax, who presented with *Pneumocystis carinii* pneumonia as a complication of previously undiagnosed HIV infection.

Case report

A 19-year-old male drama student presented to a local hospital's casualty department on Boxing Day with a four-week history of a dry cough, increasing shortness of breath, fever and nausea. In the preceding week he had developed watery diarrhoea for which his general practitioner had prescribed metronidazole. There was no past medical history of note and in particular no history of asthma, smoking, foreign travel or inhaled or intravenous drug misuse. He was otherwise well, but had lost nearly 40 kg in weight over the last 12 months.

On examination he looked unwell and was febrile. He had labial herpes simplex infection and gingivitis, with marked cervical lymphadenopathy. His pulse rate was 110 beats/min, there were no heart murmurs and his blood pressure was 110/60 mmHg. Auscultation of his lung fields revealed fine bilateral basal crepitations. There were no abnormal abdominal or neurological signs.

Emergency investigations revealed the following: haemoglobin 12.0 g/dl with normal indices; white cell count $3.1 \times 10^9/l$ with marked lymphopaenia; platelet count $220 \times 10^9/l$. Renal and liver function tests were normal. Arterial blood gas measurements were not performed. His chest X-ray showed increased shadowing throughout both lung fields. Sputum culture revealed normal flora only, and staining for acid- and alcohol-fast bacilli was

negative. Blood cultures were also negative. A provisional diagnosis of atypical pneumonia was made, and treatment with intravenous erythromycin 500 mg 6-hourly was commenced. After 24 hours he was afebrile. A subsequent glandular fever slide test was positive and tuberculin skin test negative. The antibiotics were stopped, and he was allowed home after 12 days.

Within four days he returned to hospital with pleuritic chest pain, breathlessness, fevers and neck swelling. On examination there was central cyanosis, and subcutaneous emphysema was noted in his neck. His chest X-ray showed evidence of a pneumomediastinum, without pneumothorax (figure). Arterial blood gas analysis revealed pO_2 3.6 kPa, pCO_2 5.0 kPa and pH 7.42 (breathing air).

Despite intravenous amoxycillin and clavulanic acid (1 g 6-hourly) and supplementary oxygen (60%), his condition continued to deteriorate. Following an opinion from a respiratory specialist he was counselled for HIV antibody testing, though denied any risk factors. The HIV test was positive.

A clinical diagnosis of *Pneumocystis carinii* pneumonia (PCP) was made and high dose intravenous cotrimoxazole (120 mg/kg) therapy was started, and therapy with 60% oxygen continued. He was transferred to a specialist centre for AIDS care. Within 24 hours his condition had further deteriorated, and he was observed, though not initially ventilated, on an Intensive Care Unit. Neither

Figure Chest X-ray showing subcutaneous emphysema, pneumomediastinum and a ground-glass appearance of both lung fields

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steroid treatment or nasal continuous positive airway pressure therapy were given, for fear of increasing the presumed alveolar leak into the mediastinum. After three days, however, he developed acute pleuritic pain and worsening breathlessness. A chest X-ray showed a large pneumothorax. He was therefore sedated, paralysed and ventilated via an endotracheal tube. An intercostal chest drain was inserted. A subsequent fiberoptic bronchoscopy and bronchoalveolar lavage revealed cysts of *Pneumocystis carinii*.
Despite anti-pneumocystis treatment he remained on a ventilator for four weeks, until his death from multi-organ failure secondary to staphylococcal septicaemia. No post-mortem examination was held.

Discussion

Pneumomediastinum without pneumothorax may arise for a variety of reasons (see box) including cavitating pneumonia caused by *Klebsiella* spp and *Mycobacterium tuberculosis*.¹ Hitherto, pneumomediastinum has not been described as a presenting feature of PCP, as occurred in the case reported here. This complication has, however, been described in cases of PCP following fiberoptic bronchoscopy with lavage, transbronchial biopsy, and mechanical ventilation.²⁻⁴ In addition, cases of PCP presenting with a pneumothorax are increasingly recognised, particularly in second or third episodes of this infection.^{5,6}

Causes of pneumomediastinum without pneumothorax
Raised intrathoracic pressure: asthma barotrauma
Ruptured oesophagus: spontaneous following instrumentation
Cavitating pneumonia: <i>Aspergillus</i> spp <i>Klebsiella</i> spp <i>Mycobacterium tuberculosis</i>
Inhaled drugs: ecstasy cocaine
Miscellaneous: dental extraction arthroscopy

The air leak is thought to arise from cystic lesions (pneumatocoeles) caused by proteases released by activated macrophages, and ischemic necrosis of vessels caused by *Pneumocystis carinii*. Air may escape from a pneumatocoele and track along the vascular sheath to the hilum, and then to the mediastinum.¹ The presence of air in the mediastinum prevented optimal treatment of this patient's severe PCP. Neither steroid therapy or continuous positive airway pressure were used because of the fear that these therapies might cause further leak of air into the mediastinum.^{7,8}

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