Infection due to *Pneumocystis carinii* Simulating Lobar Bacterial Pneumonia


A case of infection with *Pneumocystis carinii* in an immunosuppressed patient which closely simulated bacterial lobar pneumonia is presented. The infiltrate visualized on the chest roentgenogram was lobar in distribution, and a loud pleural rub was heard over one of the involved lobes. The clinician must broaden his spectrum of suspicion for this infection to include lobar pneumonitis.

With the extensive use of immunosuppressive therapy and corticosteroid therapy in the patient with malignant disease, superimposed infections have become a major complication. Pneumonia secondary to infection with *Pneumocystis carinii* is one of these which is being seen with increasing frequency. It is particularly important that this infection be recognized, since approximately 40 percent of the patients can be expected to recover with appropriate therapy.1

The chest radiographic findings associated with infection with Pneumocystis have usually been described as a diffuse bilateral pneumonitis with sparing of the peripheral pulmonary fields in some instances.2 Such infection has also been seen to occur as localized nodular densities.3 Another unusual manifestation has been the sparing of previously radiated areas.4

It was, therefore, of interest to see a patient with a lobar pneumonia who proved to have infection with *Pneumocystis carinii*. This patient was of further interest in that a loud pleural rub was heard over one of the involved lobes, the clinical and radiographic picture thus closely simulating bacterial lobar pneumonitis.

**CASE REPORT**

A 68-year-old man was referred to our hospital in October 1974 for further evaluation of pneumonitis. The patient had been well until approximately one year before, when a left supravacuicular mass had been noted. Work-up at that time revealed a prostatic nodule palpable on physical examination and a right hilar prominence visible on the chest roentgenogram. Biopsy of both the supravaculicular and prostatic masses showed adenocarcinoma. The patient was then given 4,000 rads of radiation therapy to the mediastinum and supravacuicular area. In April 1974, the patient started to receive chemotherapy consisting of cyclophosphamide, vincristine, methotrexate, prednisone, and fluorouracil. He was also given therapy with estrogens.

Except for some weight loss in the ensuing months, the patient had done relatively well until about three weeks prior to his final hospital admission, when he began to develop progressively severe dyspnea and a spiking fever to 38.3°C (101°F). The patient was seen by his local physicians, who made a clinical diagnosis of pneumonia. Parenteral therapy with penicillin and gentamicin was instituted on Oct 7, 1974.

Three days later, at the time of transfer to our hospital, the patient appeared to be a chronically ill, somewhat cachetic man who was quite dyspneic at rest. His temperature was normal. On examination of the chest, transient scattered rhonchi were heard throughout both pulmonary fields, but rales were heard only over the left upper lobe and the right middle lobe. In addition, a loud pleural rub was heard over the area of the right middle lobe. The leukocyte count was 22,900/cu mm, the platelet count was 103,000/cu mm, and the hemoglobin level was 10.8 gm/100 ml. Arterial blood gas analysis obtained with the patient breathing 4 L of oxygen per minute delivered by cannula showed the arterial oxygen pressure to be 53 mm Hg, the arterial carbon dioxide tension 32 mm Hg, and the pH 7.39. The chest films showed an infiltrate in the right middle lobe and left upper lobe (Fig 1).

In view of the history and findings and since the patient was initially afebrile in our hospital, it was believed he might

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weil have a bacterial pneumonia which was responding to the antibiotic therapy. The patient continued to receive the same drugs, but by four days after admission, he was noted to be definitely more dyspneic. The physical findings remained little changed, the localized rales over the two lobes and the rub over the right middle lobe persisting. No pathogenic organisms were isolated from the sputum, and in view of the lack of response to therapy, it was decided that a more definite diagnosis was needed.

On Oct 15, an open biopsy of the right middle lobe was performed. On microscopic study of the resected lung, the alveoli were noted to be filled with eosinophlic material, which was noted to contain many Pneumocystis organisms when stained with Gomori methamine silver stain. A rare nest of tumor cells was seen in the lymphatic vessels. On Oct 17, the patient started to receive therapy with pentamidine isethionate (200 mg intramurally daily); however, he showed little clinical response, and the chest roentgenogram remained unchanged, the lobar infiltrates persisting. Death occurred on the seventh day of treatment.

At postmortem examination the right middle and left upper lobes showed evidence of consolidation, and Pneumocystis carinii was demonstrated with the silver stain in both lobes. No areas of bacterial pneumonitis were noted, and the postmortem bacterial cultures of the lungs were negative. There were some emphysematous changes throughout the lungs, but no blebs or bullae were present. Occasional tumor cells were seen in the lymphatic vessels of all lobes, but the pleural and subpleural areas were not otherwise involved with the tumor.

**Discussion**

Pneumonia due to *Pneumocystis carinii* is a potentially curable disease, and, therefore, it is of great importance that clinicians be well familiar with its atypical, as well as its typical, presentations. The case reported here documents for the first time that infection with Pneumocystis may occur as a lobar infiltrate. One other case has been reported in which a lobar distribution of the disease was strongly suspected; however, in that patient, no biopsy was performed at the time that the lobar distribution was noted, and by the time the etiologic diagnosis was made at postmortem examination 15 days later, there was a patchy infiltrate throughout all the pulmonary fields. Furthermore, the patient had been receiving antibiotic therapy in the interim, which could well have resolved an associated bacterial lobar pneumonitis.

Of further interest in our patient was the presence of a loud pleural rub over one of the involved lobes. No other cause for the rub, such as a pulmonary embolus, bacterial pneumonitis, or pleural involvement with the malignant neoplasm, was demonstrated during the patient’s life or at postmortem examination. Thus, a pleural rub must be considered as one of the manifestations of infection with Pneumocystis. The question of whether pneumonitis due to Pneumocystis may be associated with pleural effusions remains unanswered. Two of the patients with infections due to Pneumocystis who were reported by Forrest had effusions, but because of the presence of other possible causes of the effusions, no definite conclusions could be made.

As demonstrated by our case, the infection due to Pneumocystis can closely simulate a bacterial pneumonia with a lobar distribution of the infiltrate seen on the chest roentgenogram and a localized rub heard on physical examination. These observations further broaden the clinical settings in which the clinician must suspect infection with this organism.

**References**


**Pneumonitis due to Corynebacterium equi**

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*Corynebacterium equi*, a known cause of pneumonitis in foals, calves, and swine, was isolated from the sputum and bronchial washings of a child with pneumonitis and leukemia. Clinical improvement followed the administration of chloramphenicol, and cultures of sputum specimens were sterile until relapse occurred after antibiotic therapy was terminated. Cure was achieved with a second course of chloramphenicol therapy. *Corynebacterium equi* was not isolated from 1,181 samples of sputum from other immunosuppressed children with cancer.

Some infectious diseases encountered by immunosuppressed patients have either not been previously reported in the literature or have only been described to a very limited extent. Under these circumstances, single case reports provide a means for accumulation of knowledge on entities rarely encountered, even in large medical centers.

The purpose of this report is to describe a case of pneumonia caused by *Corynebacterium equi* in a child with acute lymphocytic leukemia. *Corynebacterium equi* is a well-documented cause of pneumonia in calves, foals, and swine, as well as of lymphadenitis in pigs. Two cases in humans have been described, both occurring in adults.

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