

PULMONARY ACTINOMYCOSIS : PLAIN FILMS AND CT IMAGES

Patchrin PEKANAN^{1,2}, Supanee NIRAPATHPONGPORN^{1,2},
Chirote SUCHATO², Prasit KIRATIKANOND³

ABSTRACT

A case report of pulmonary actinomycosis in a middle aged diabetic patient was presented. Plain chest film and CT scan of the lesion showed right lower lobe in location. The lesion presented as a mass lesion with small cavities and surrounding alveolar infiltration. The pleural space and bony parts were not involved due to partial treatment. Inadequate treatment showed worse progression. Needle aspiration was suggested for early diagnosis and treatment.

Key Words Pulmonary actinomycosis, plain film, CT scan

Actinomycosis is caused by members of the bacterial family Actinomycetaceae, of which the most important genus is *Actinomyces*. The organisms are nonmotile and nonspore-forming; branching filaments about 0.2 to 0.3 μm . in diameter. They are anaerobic or microaerophilic. They are usually called sulfur granules because of their yellow color, although actual sulfur content is minimal (1,2). The organisms are normal inhabitants of human oropharynx. The disease is believed to be acquired by the spread of endogenous organisms from these sites, usually directly from the oropharynx into the lungs by aspiration or into the gastrointestinal tract by swallowing; spread occurs via the blood stream to distant tissues occasionally. Rare cases of exogenous transmission by human or animal bite or by other cutaneous trauma have been reported (3). Some cases result from extension of disease through the esophagus or diaphragm from primary sites in the gastrointestinal tract. The disease is of worldwide distribution and no age or race is immune; men are affected slightly more often than women, and there is no occupational predilection or seasonal variation (4).

Before the advent of antibiotics, actinomycosis was the most commonly diagnosed "fungus" disease of the lungs, presenting a fairly typical clinical picture of empyema and sinus tracts in the chest wall. This advanced stage is rarely seen now.

We report a case of pulmonary actinomycosis by plain film and CT images.

CASE REPORT

A 47 years-old female diabetic patient came to the hospital due to low grade fever and chronic cough. The sputum was white and the amount was not much. She was known to have "pneumonitis" for a year and was suggested by other doctors to have an operation due to this "pneumonitis problem". At the admission-time, she had low grade fever with measured temperature 38 degree celsius. Other physical examination was negative. Endoscope revealed no endobronchial lesion. Plain film of the chest (Fig.1) showed alveolar process at right lower lung zone with multiple cavities. CT scan of the thorax showed a mass-like lesion with small cavities

¹Department of Radiology, Ramathibodi Hospital, Rama 6 Street, Bangkok 10400, Thailand.

²Department of Radiology, Samitivej Hospital, Sukhumvit 49, Bangkok 10110.

³Department of Medicine, Samitivej Hospital.

and surrounding alveolar process at right lower lobe (Fig.2). Aspiration of the lesion under CT scan guidance was performed, yielded foul smell pus. The pathology revealed fragment of blood clot containing many polymorphonuclear cells and clumps of actinomyces. Penicillin 12 m.u./ day was given to the patient with disappearance of the fever after 7 days and plain film (Fig. 3) showed partial clearing of the upper part of the lesion. The patient was discharged and was referred to receive further treatment with the doctor at her home-town. Two months later she came back with worse progression of the disease at the right lower lobe as shown in the figure 4.

DISCUSSION

The typical pattern in the acute variety of actinomycosis consists of airspace pneumonia, without recognizable segmental distribution, commonly in the periphery of the lung and with a predilection for the lower lobes (1). It is thus roentgenologically indistinguishable from acute pneumococcal pneumonia. Once the pneumonia has developed, the course of events depends largely upon whether antibiotic therapy is instituted. With appropriate therapy, most cases resolve without complications. If therapy is not instituted, a lung abscess may develop, and the infection may extend into the pleura (with consequent empyema) and into the chest wall, with osteomyelitis of the

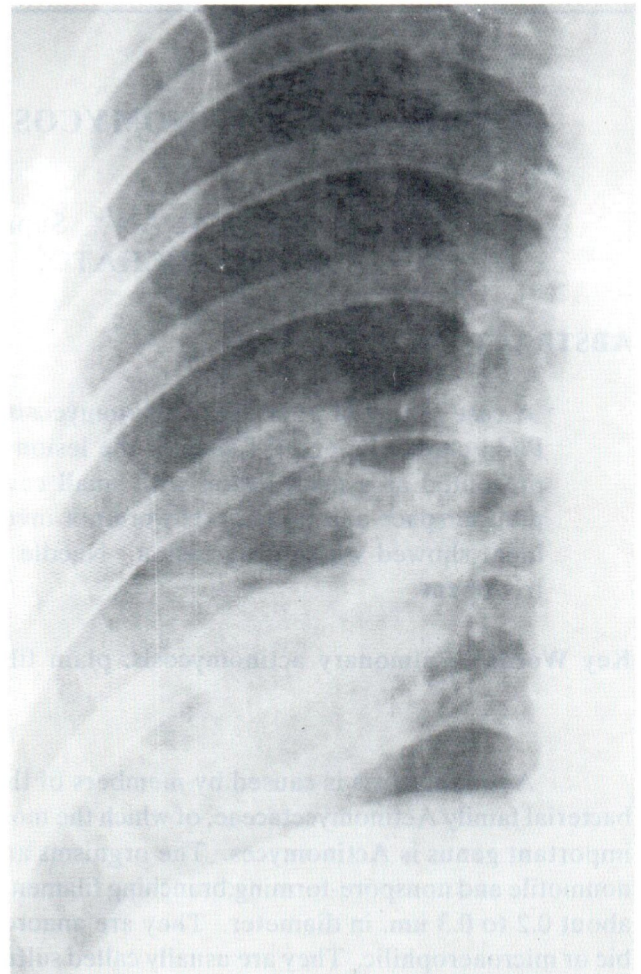


Fig. 1. P.A. view of the chest at right lower lobe showed thick wall cavitary lesions with fluffy border

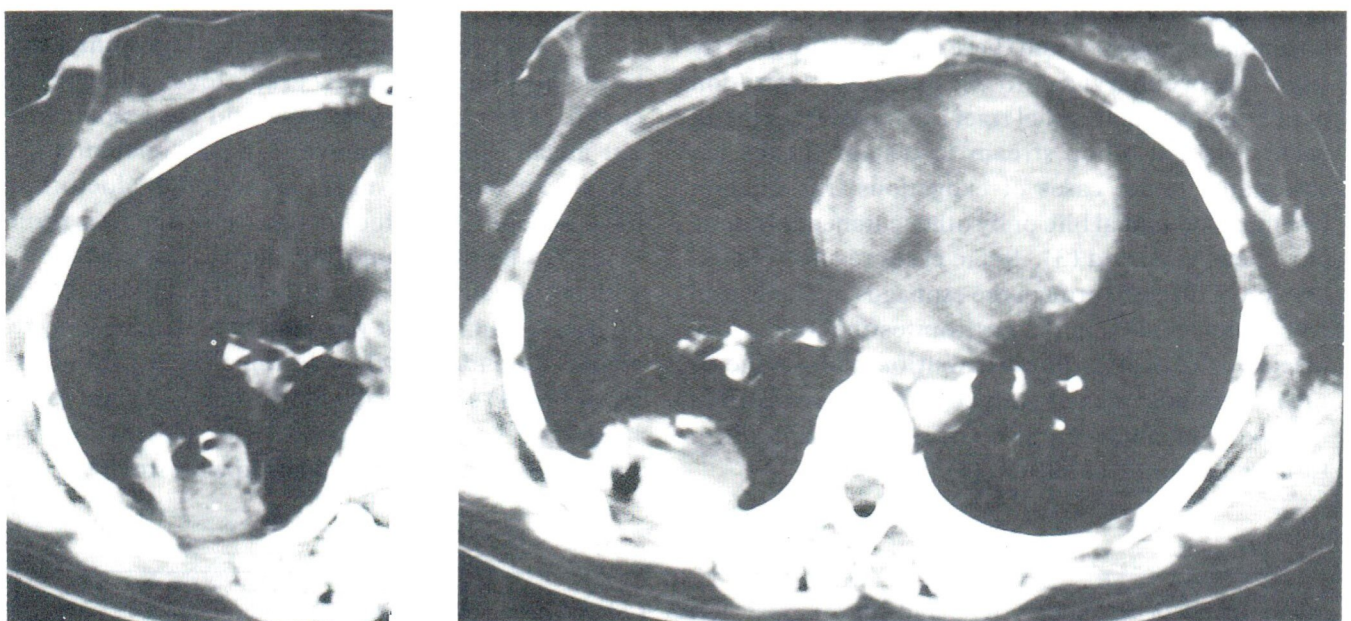


Fig. 2a. CT scan of the thorax at the lesion of right lower lobe, using mediastinal window showed a mass like lesion with small eccentric cavities.

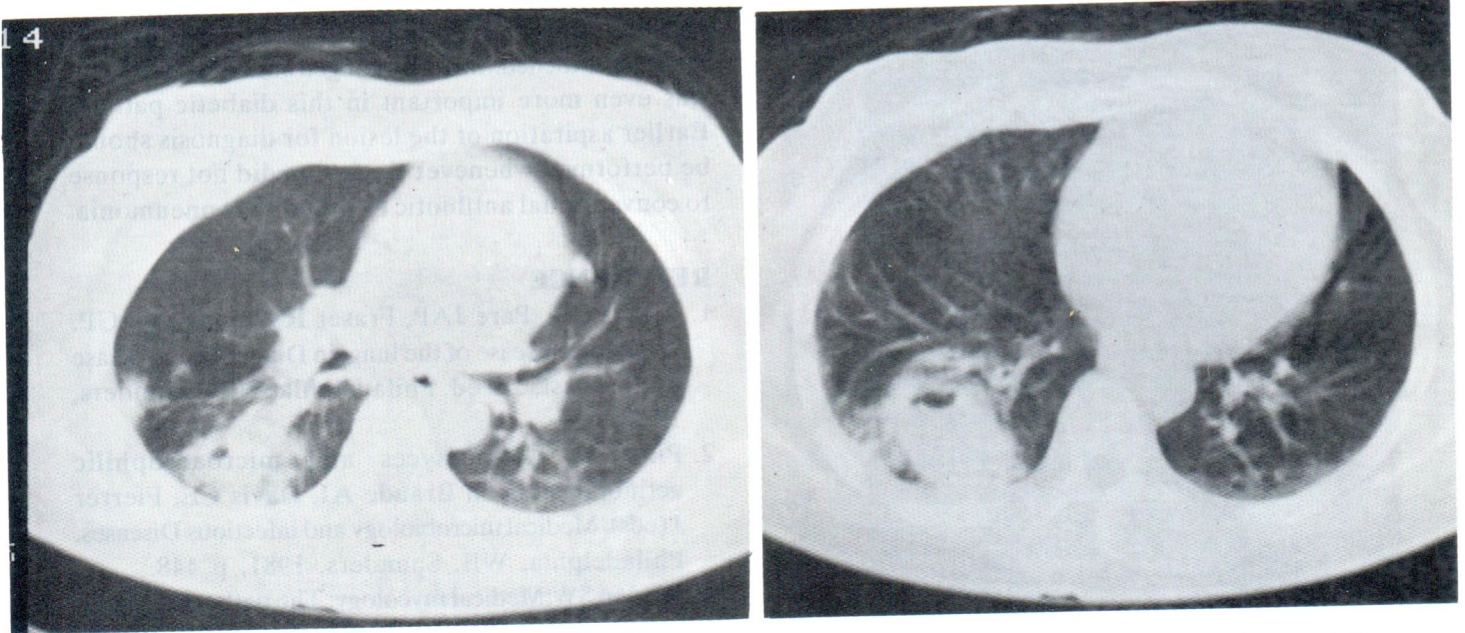


Fig. 2b. CT scan of the thorax, using lung window showed multiple small alveolar lesions near the mass like lesion.

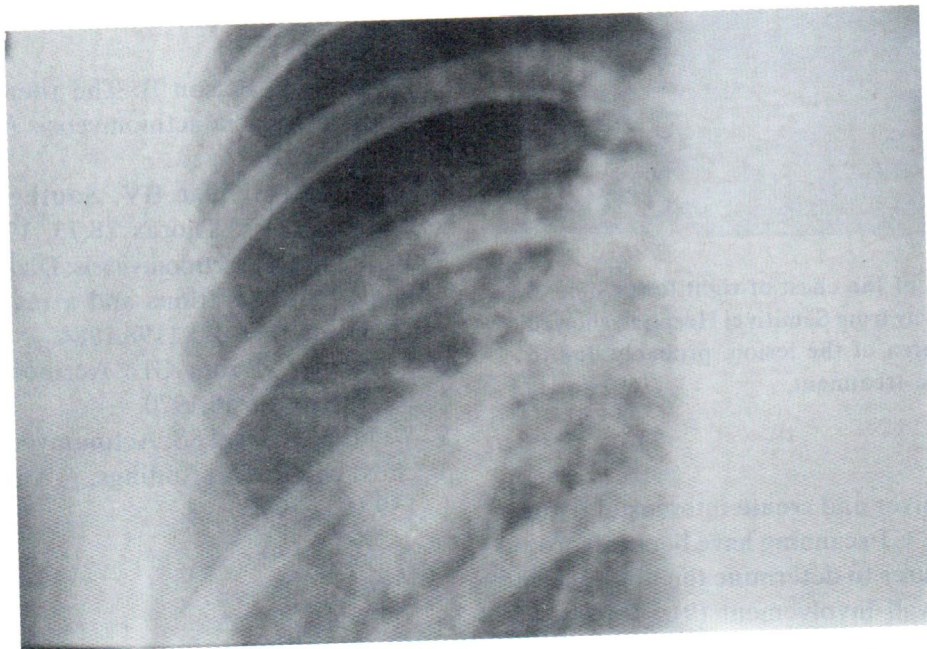


Fig. 3. Plain film of the chest at right lower lobe, 7 days post Penicillin treatment, showed partial clearing at the superior part of the lesion.

ribs and abscess formation in these areas. In one serie of 15 cases (5), a mass lesion was the initial roentgenographic manifestation in six, cavitation was identified in six, pleural effusion in the form of either empyema or pleural thickening in 12 and chest wall involvement in nine. Like other anaerobic pulmonary infections that originate in oropharynx, actinomycosis

frequently presents as a mass that simulates pulmonary carconoma (6). Since actinomycosis usually require prolonged antibiotic therapy, a pulmonary lesion may undergo initial remission following institution of therapy, only to exacerbate when therapy has been withdrawn too early (7). The disease may start in a lower lobe, penetrate through the dia-

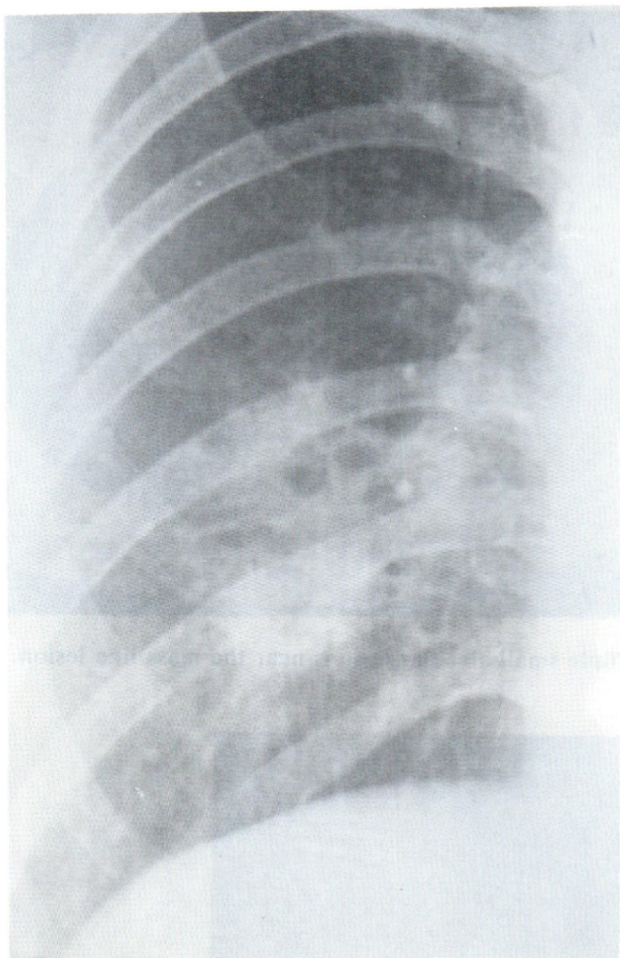


Fig. 4. Plain film of the chest at right lower lobe, 2 months away from Samitivej Hospital, showed widened area of the lesion, probably due to inadequate treatment.

phragm into the liver and create intercostal fistulae along the way (8). CT scanning have been advocated as useful procedures to determine the presence and extent of chest wall involvement (9). Rarely, the disease becomes disseminated, with the development of a miliary pattern roentgenographically.

Our patient had a chronic course and had received some antibiotic treatment for pneumonitis for a year. The presented images were those of mass lesion and cavities, besides surrounding alveolar process. The received prior antibiotic helped to prevent pleural and chest wall complication. Some improvement was shown after 7 days treatment with penicillin, however, the treatment at her hometown might be inadequate

and discontinuous, so that the area of the involvement was widened. More prolonged antibiotic treatment was even more important in this diabetic patient. Earlier aspiration of the lesion for diagnosis should be performed whenever the lesion did not response to conventional antibiotic treatment for pneumonia.

REFERENCE

1. Fraser RG, Pare JAP, Fraser RS, Genereux GP. Infectious disease of the lung; in *Diagnosis of disease of the chest*, 3rd ed. Philadelphia, W.B. Saunders, 1989.
2. Pine L: Actinomyces and microaerophilic actinomucetes, in Braude AI, Davis CE, Fierrer J (eds): *Medical microbiology and infectious Diseases*, Philadelphia, WB, Saunders, 1981, p 448.
3. Rippon SW: *Medical mycology: The pathogenic fungi and the pathogenic actinomycetes*. 3rd ed. Philadelphia, WB Saunders, 1988.
4. Harvey JC, Cantrell JR, Fisher AM: Actinomycosis: Its recognition and treatment. *Ann Intern Med* 46:868,1957.
5. Flynn MW, Felson B: The roentgen manifestations of thoracic actinomycosis *Am J Roentgenol* 110:707,1970.
6. Slade PR, Slesser BV, Southgate J: Thoracic actinomycosis. *Thorax* 28:73, 1973.
7. Bennhoff DF: Actinomycosis: Diagnostic and therapeutic considerations and a review of 32 cases. *Laryngoscope* 94: 1198,1984.
8. Schwarz J, Baum GL: Actinomycosis. *Semin Roentgenol* 5:58,1970.
9. Webb WR, Sagel SS: Actinomycosis involving the chest wall: CT findings. *Am J Roentgenol* 139:1007,1982.