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Pulmonary Actinomycosis: CT Findings

Chun Hwan Han, M.D., Jung-Gi Im, M.D., Kil Sun Park, M.D., Man Chung Han, M.D.

Department of Radiology, College of Medicine, Seoul National University

〈국문초록〉

흉부 방선상균병(Actinomycosis)의 전산화단층촬영 소견

서울대학교 의과대학 방사선과학교실

한 춘 환·임 정 기·박 길 선·한 만 청

흉부의 방선상균병(Actinomycosis)은 근래 항생제의 보편화된 사용으로 방사선학적 소견을 나타내는 상태에서 발견되는 경우가 매우 희귀하므로 방사선학적 감별 진단에 포함되지 않는 경우가 대부분이다. 저자 등은 최근 폐 방선상균병으로 진단된 5예의 단순 흉부 X선 및 CT 소견을 정리보고한다.

환자의 임상 증상은 기침 및 혈담 그리고 흉부 동통 등이었고 발열은 심하지 않았다. 단순 흉부 X선에서는 4예에서 만성적인 경계가 불분명한 기공경결(air-space consolidation), 혹은 종괴양의 소견을 보였다. CT상 침범부위는 좌우폐, 혹은 특정 폐엽의 호발 경향을 보이지 않았으며, 1내지 2개의 대엽을 침범하였다. CT 양상은 4예에서 종괴양의 폐경결을 보였으며 3예에서는 공동과 내부에 괴사를 시사하는 저음영도 부위를 포함하고 있었다. 흉막비후가 전례에서 있었으며 그 중 3예에서 늑막삼출이 관찰되었다. 3예에서 종격동 림프절이 직경 1−2 cm 정도로 비대해 있었다. 폐엽간열을 통과하는 병변의 파급은 1예에서 관찰되었다.

흉부 방선상균병은 만성의 폐경결 및 공동이 주된 소견으로 폐암 또는 폐결핵 등과 감별을 요하며 상기의 진단이 배제될 경우 이 질환의 가능성을 고려하여야 할 것으로 사료된다.

Index Words: Lung, mycosis
Lung, CT
Actinomycosis

Pulmonary actinomycosis is believed to be a rare disease. The radiological manifestations of the disease are for the most part nonspecific but the chest wall lesion is strongly suggestive of actinomycosis[1]. As this classical presentation with chest wall involvement is uncommon by early administration of antibiotics, the diagnosis of pulmonary actinomycosis is easly missed. The authors performed a retrospective analysis of five proved cases of actinomycosis and described the chest radiograph and CT findings.

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Case Reports

Case 1.

A 65-year-old man had a six months' duration of chest pain and developed mild fever and cough with blood-tinged sputum. Antituberculosis therapy was not effective. Sputum smear and culture for tubercle bacilli was negative. WBC count on

admission was 13,000. A chest radiograph showed streaky hazy density in the upper division of the left upper lobe (Fig. 1a) and later became a mass-like consolidation(Fig. 1b). CT scans showed a nodular marginated mass-like lesion and a cavity with air-fluid level (Fig. 1c). Transpleural extension of consolidation from the left upper lobe to the left lower lobe was demonstrated (Fig. 1d). Pleural thickening was visible along the peripheral margin of the mass-like lesion. Mediastinal lymph nodes were aggregated and enlarged about 1 cm in diameter. Bronchoscopy revealed mild luminal narrowing of the posterior segment of the left upper lobe without a endotracheal lesion. Percutaneous fine needle aspiration biopsy confirmed actinomycosis.

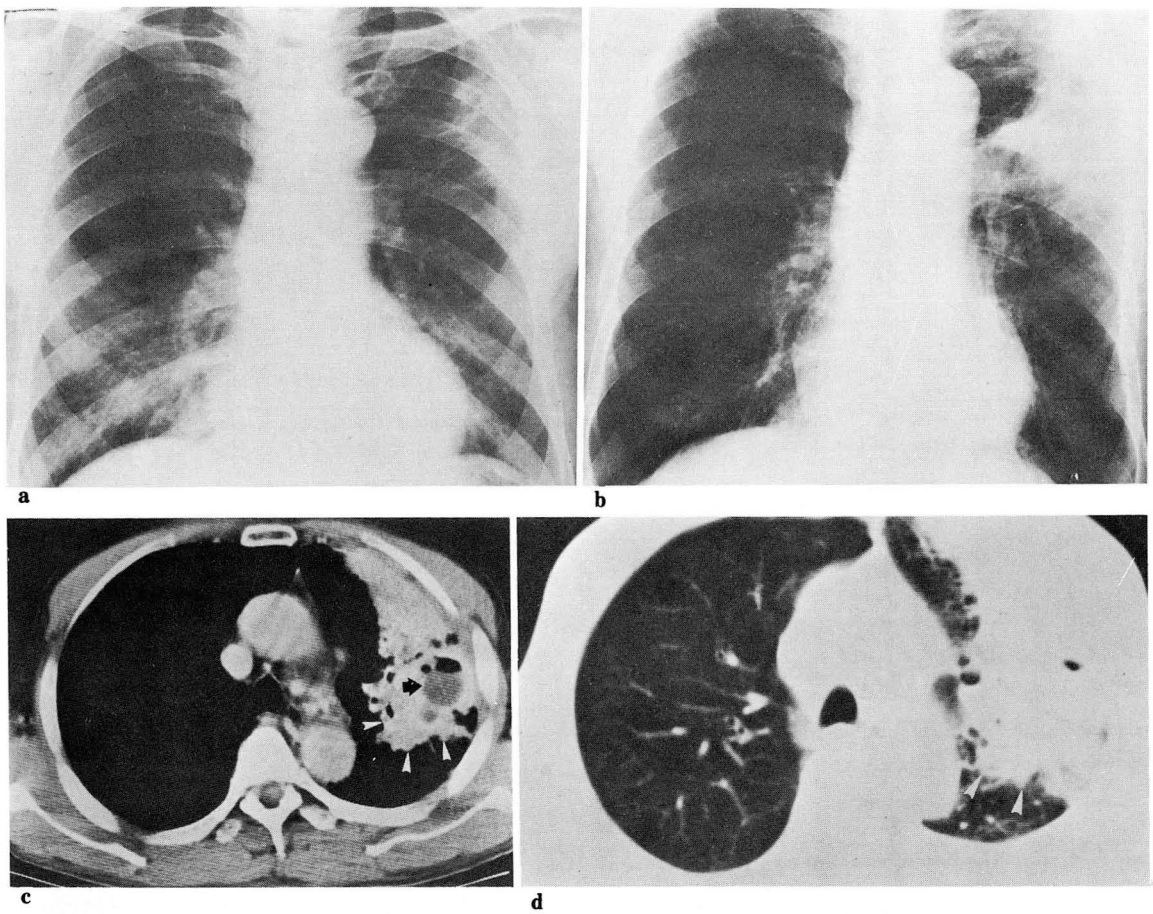


Fig. 1. Serial chest radiographs(a, b) and CT scans (c, d) in a 65-year old male patient (case 1).
(a) Ill-defined hazy air-space consolidation associated with linear densities is seen in the left upper peripheral lung field.
(b) Chest radiograph taken seven months after (a) shows peripheral consolidation-like lesion which has been increased in area and density.
(c) CT scan at the level of the tracheal carina obtained ten days before (b) shows peripherally located air-space consolidation in the anterior segment of the left upper lobe with relatively sharp transition of the normal lung and lobulated border, especially posteriorly, mimicking a solid mass (arrowheads). Note also cavity with air fluid level (arrow) within the consolidated lung and enlarged, aggregated lymph nodes in A—P window area.
(d) Lung window setting of (c) show irregular marginated posterior border of the lung lesion extending beyond the expected position of the major fissure (arrowheads).

Case 2.

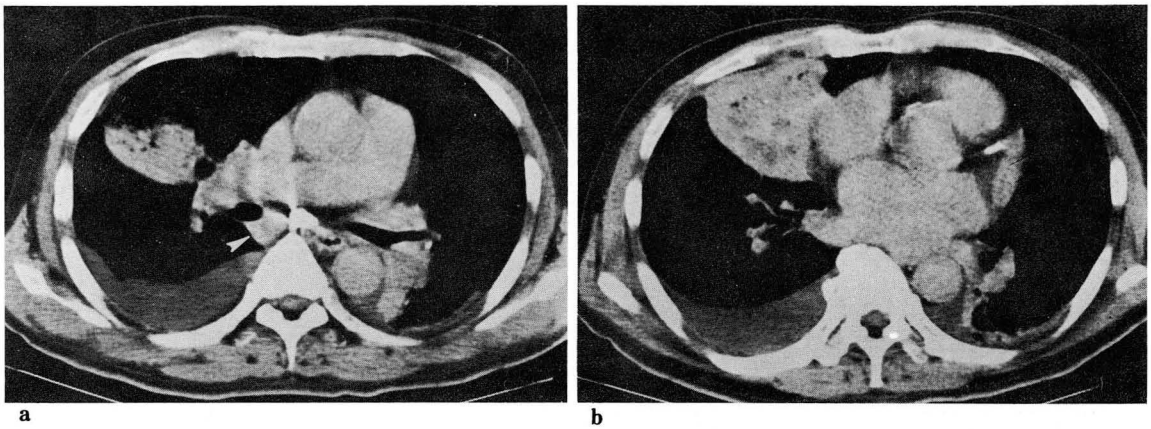
A 65–year–old male patient presented about six months' history of cough and occasional hemoptysis. Mild fever and dyspnea occurred. WBC count was within normal range. A chest radiograph showed a mass-like lesion in the right middle lobe. CT scans showed a mass-like consolidation in the right middle lobe, the right lower lobe and the left lower lobe (Fig. 2b). Pleural thickening and bilateral effusion were identified. Right tracheobronchial and subcarinal lymph nodes were enlarged about 1–2 cm in diameter and a calcified node was detected (Fig. 2a). Bronchoscopy showed a bronchial narrowing of the right middle lobe, but no endobronchial mass was found. Percutaneous aspiration biopsy confirmed the globoid colonies of organisms, highly suggesting actinomycosis. The patient was treated with penicillin for 6 months and made a recovery.

Case 3.

A 60–year–old man was admitted with three months' history of right lower chest pain and a chronic cough. Body temperature was normal. A chest radiograph showed a well-defined mass-like consolidation in the right upper lobe (Fig. 3a). CT scans were performed to evaluate the squared-shaped mass. CT scans showed a round, thick-walled mass-like cavitary lesion with a necrotic low density in the right upper lobe (Fig. 3c). Inflammatory pleural thickening adjacent to the mass-like lesion was identified. Multiple paratracheal lymph nodes were aggregated and enlarged. Bronchoscopy revealed a complete subsegmental obstruction with pus-like material at the anterior segment of the right upper lobe, however, no definite endobronchial mass was observed. Percutaneous aspiration biopsy proved some microfilamental clumps representing actinomycosis. About 2 months after penicillin treatment, the patient was subsequently improved (Fig. 3b).

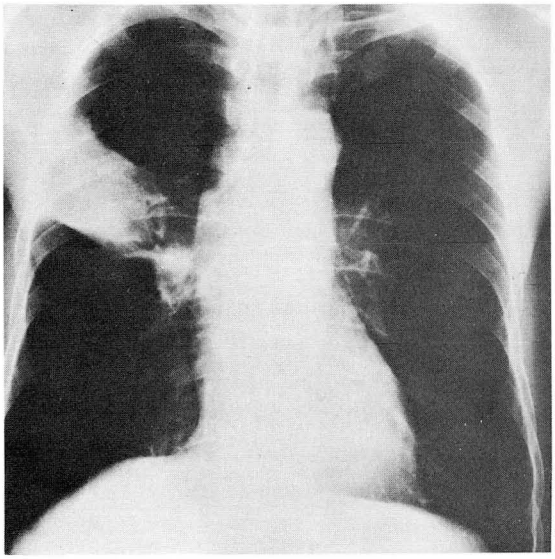
Case 4.

A 66–year–old man presented with dyspnea and pruductive cough. He had a history of pulmonary tuberculosis 35 years ago. Sputum AFB on admission was negative. A chest radiograph showed a fibrotic lesion in the right upper lobe and totally destructive pattern of the left lung. CT scans showed a loss of lung volume and irregular consolidation associated with pleural thickening and a small amount of effusion. Left thoracotomy was perfor-



a b

Fig. 2. CT scans of a 65-year-old male patient (case 2).
(a) Scan at the level of subcarina shows enlarged lymph nodes in the right subcarinal area (arrowhead) as well as a calcified node. Mass-like consolidation is seen in the right middle lobe and the left hilar area. Note also bilateral pleural effusion.
(b) CT scan at 3 cm below (a) shows a mass-like consolidation in the right middle lobe with bilateral pleural effusion.



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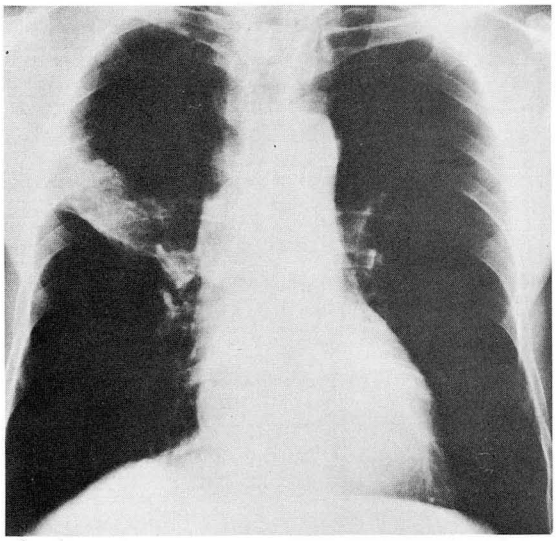

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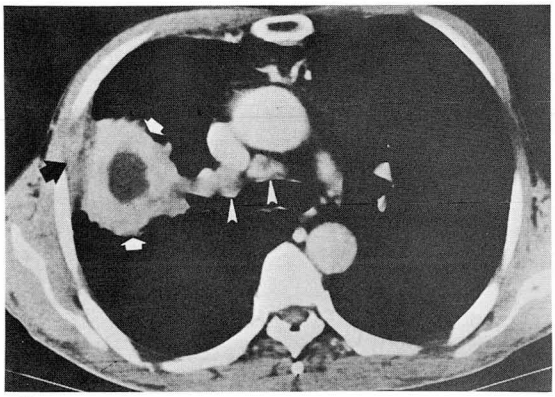

c

← **Fig. 3.** Chest radiographs (a, b) and CT scan (c) of a 60-year-old male patient (case 3).
(a) Initial chest radiograph shows a well marginated squared-shaped consolidation in the right upper lobe.
(b) Two months after treatment with penicillin, follow-up chest radiograph shows decrease in size and density of the right upper lobe lesion.
(c) CT scan at the level of the ritht upper lobe bronchus shows a round, relatively well marginated mass-like lesion in the right upper lobe with central necrotic low density and uniformly thick, peripheral, rather enhancing soft tissue density (white arrows). Note also adjacent inflammatory pleural thickening (black arrow) and enlarged right tracheobronchial lymph nodes (arrowheads).

med. The pleural cavity was obliterated with thick adhesion from the apex to the diaphragm. Left lung was destroyed with a caseation material. On pathological examination a small lesion of actinomycosis was found within the destroyed lung by tuberculosis.

Case 5.

A 52–year–old male patient was admitted to hospital with one month's history of cough. Blood-tinged sputum and chest tightness were developed. Mild leukocytosis was present. His body temperature was within normal limits. A chest radiograph showed a mass-like lesion in the superior segment of the left lower lobe (Fig. 4a). CT scans showed a homogeneous mass-like consolidation with smooth-walled low density cavity (Fig. 4b). Localized pleural thickening was identified. There was no pleural effusion. Bronchoscopy revealed the obstruction due to chronic inflammatory change at the superior segment of the left lower lobe. Percutaneous aspiration biopsy revealed the clumps of the filamentous bodies with numerous neutrophils and histiocytes, suggesting actinomycosis with abscess. With penicillin therapy for 2 months the radiological abnormalities improved slightly.

Discussion

Actinomyces israeli is a normal inhabitant of human mouth and infection of the lung is usually

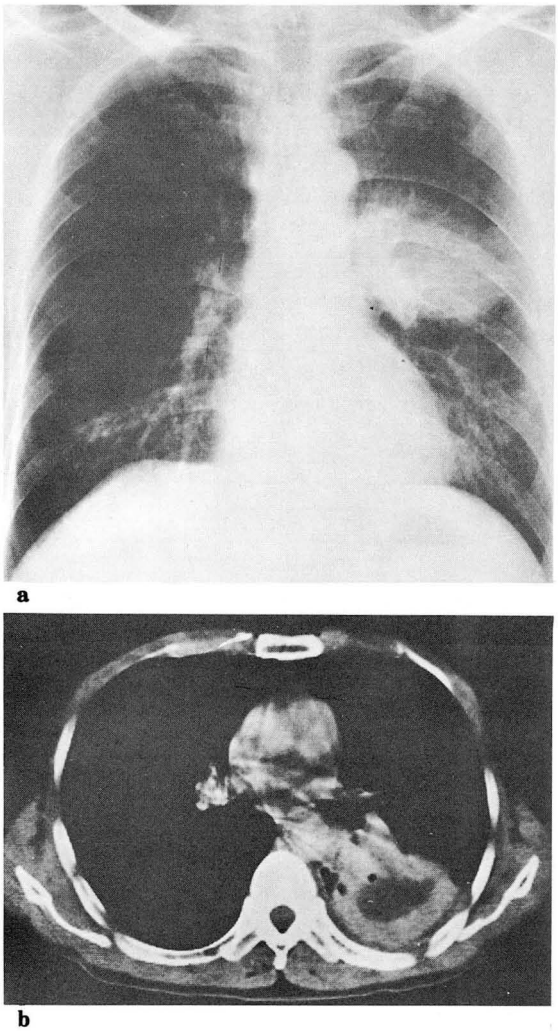

Fig. 4. Chest radiograph (a) and CT scan (b) of a 52-year-old male patient (case 5).
(a) chest radiograph shows a mass-like density in the superior portion of the right lower lobe area.
(b) CT scan at the level of subcarina shows mass-like consolidation of the superior segment of the left lower lobe. Note central necrotic low density and uniformly thick-surrounding soft tissue density. Superior segmental bronchus is obstructed.

by inhalation or aspiration of the organism. The characteristic sulfur granules found in the exudate from actinomycotic lesions consist of clumps of the organism. Actinomyces naeslundi is also a saprophytic member of the normal mouth flora to produce empyema[2].

The clinical features of pulmonary actinomycosis in our studies were chronic cough, blood-tinged sputum and low-grade fever associated with chest pain and dyspnea. Flynn and Felson[1] evaluated fifteen cases of pulmonary actinomycosis. The form of mass in the lung was common and one or more small cavities were present. Transpleural extension into adjacent lobes was identified. In one of our five cases, extension across a interlobar fissure was demonstrated (Fig. 1d). The involvement of chest wall is an important radiological manifestation and consists of soft tissue swelling, periostitis of the ribs and rib destruction[1]. CT scan is helpful in the evaluation of pulmonary actinomycosis with extension to involve the chest wall[3].

In reviewing the CT findings of our five patients, mass-like consolidations with low density foci representing sites of necrosis were present in four (Table 1). Air-fluid levels were observed in two of these four cases (Fig. 1c). Pleural thickening occurred in all of our cases and pleural effusion was seen in three patients (Fig. 2). Mediastinal lymph nodes were aggregated and enlarged (Fig. 2a).

Table 1. CT Findings of Pulmonary Actinomycosis

CT Finding		Total
Dense Consolidation		4
Mass-Like	4	
Cavitation	3	
Pleural Disease		5
Thickening	5	
Effusion	3	
Transfissural Extension		1
Mediastinal LN Enlargement		3

The incidence of pulmonary actinomycosis is declined recently and the chest wall involvement is rare because of antibiotics treatment[4,5,6]. The conditions of a mass-like lesion and cavitation that simulate pulmonary actinomycosis on chest radi-

ograph are lung cancer and pulmonary tuberculosis[7]. Indeed, lung cancer and pulmonary tuberculosis are more common than actinomycosis and tend to involve the chest wall frequently, so that pulmonary actinomycosis is hardly considered to be included in the differential diagnosis of mass-like and cavitary lung lesions.

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