CASE REPORTS

Metastatic Lung Cancer Presenting as Thoracic Empyema in an Old Patient

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ABSTRACT

An 83-year old male presented to the emergency department with productive cough and acute shortness of breath. Imaging, biochemical and microbiological studies of the pleural fluid indicated empyema. After antibiotic treatment and tube drainage, symptoms of the patient persisted and he received thoracoscopic decortication. His condition improved gradually, but histopathological examination showed metastatic adenocarcinoma of the lung. Clinicians are alerted to the possible association of malignant tumours and empyema in older patients.

Keywords: Decortication, lung cancer, preoperative empyema, video-assisted thoracoscopy

Cáncer Metastásico de Pulmón Presentado Como Empiema Torácico en un Paciente Anciano

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RESUMEN

Un anciano de 83 años acudió al servicio de urgencias con tos y disnea aguda. El análisis de imagen, así como los estudios bioquímicos y microbiológicos del líquido pleural indicaron la presencia de un empiema. Después del tratamiento antibiótico y el drenaje con tubo, los síntomas del paciente persistieron, por lo cual se le realizó una decorticación toracoscópica. Su condición mejoró gradualmente, pero el examen histopatológico reveló un adenocarcinoma metastásico del pulmón. Se alerta a los clínicos en relación con la posible asociación de tumores malignos y empiemas en pacientes de edad avanzada.

Palabras claves: Decorticación, cáncer de pulmón, empiema preoperatorio, toracoscopia asistida con video

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INTRODUCTION

Lung cancer-associated empyema has been reported in < 0.3% patients (1). Pleural fluid should be obtained for microbiological analyses in order to exclude the possibility of malignancy and tuberculosis (2). Chest radiographs, computed tomography (CT) and pleural fluid analyses can help in the diagnosis of patients with lung cancer-associated empyema. We describe in this paper an elderly patient without Type 2 diabetes mellitus in whom preoperative empyema was diagnosed and in whom the final pathology was metastatic adenocarcinoma of the lung.

CASE REPORT

An 83-year old man presented to the emergency department with a one-month history of productive cough followed by shortness of breath and whitish phlegm prior to admission. The patient had no Type 2 diabetes mellitus. His vital signs were as follows: temperature, 38.2 °C, heart rate, 116 beats/minute and blood pressure, 132/78 mmHg. Physical examination showed decreased breath sounds in the left lung field. The results of laboratory studies revealed a slightly increased white cell count of 11 510/mm^3, and C-reactive protein levels of 28.43 mg/dL. Blood chemistry results were in the normal

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range. Chest radiography showed pleural effusion in the left thorax (Fig. 1). Diagnostic thoracentesis was performed for

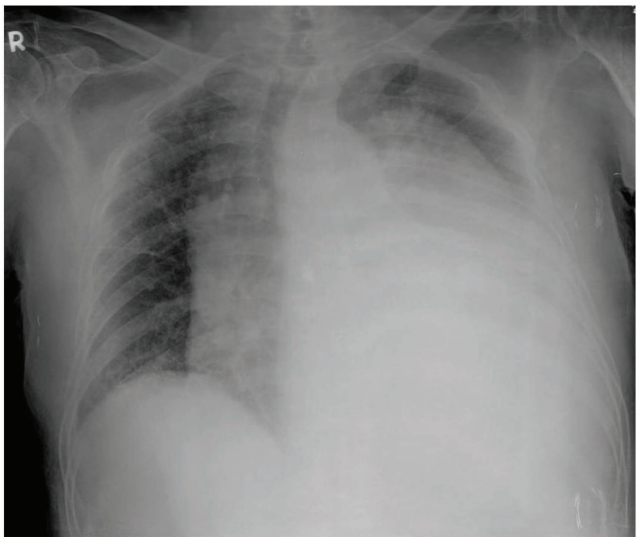

Fig. 1: Chest radiography shows a large pleural effusion in the left thorax and mediastinal shifting.

pleural fluid analysis. The results of biochemical and microbiological studies of the pleural fluid were as follows: pH, 7.29; erythrocyte count, 574 000/mm^3, leukocyte count, 67 150/mm^3, lactate dehydrogenase, 11 785 U/L, glucose, < 2 and total protein, 20.8 g/dL. A chest CT revealed massive mixed high-density pleural fluid accumulation in the left lung (Fig. 2). The patient underwent chest tube insertion accom-

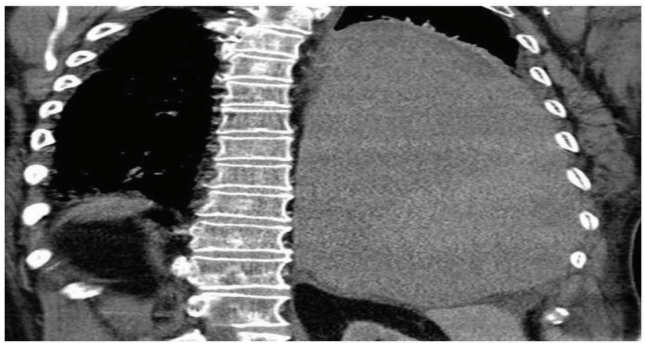

Fig. 2: Computed tomographic scan shows mixed high-density pleural fluid accumulation in the left lung.

panied by dark red fibrinolytics and his symptoms improved. Cytological examinations showed extensive tissue necrosis without malignant cells. A pleural effusion culture revealed *Klebsiella pneumoniae*. After thoracic drainage and antibiotic treatment, an intermittent high fever persisted for seven days. Video-assisted thoracoscopic decortication was performed to prevent ongoing infection. At surgery, a severe inflammatory adhesion was found in the left thoracic cavity. We removed the peels and eliminated the excess fluid that had accumulated within the pleura. Histopathological examination of the postoperative specimen showed an acute necrotizing inflammatory background characterized by necrotic debris and glandular tumour cells (Fig. 3).

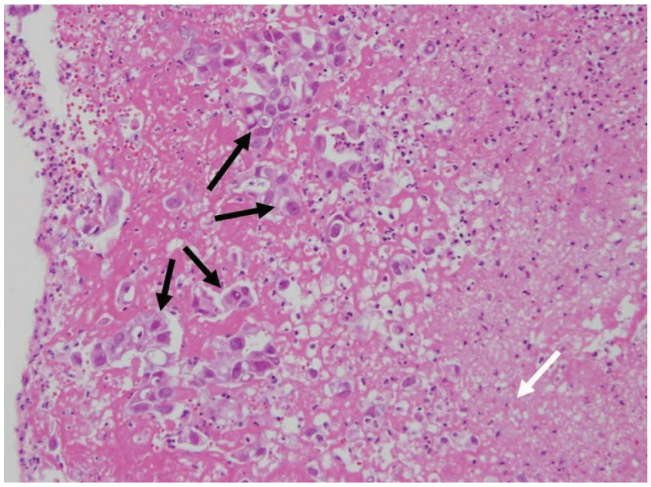

Fig. 3: High-power (H&E ×200) photomicrography shows nest or glandular tumour cells (black arrow) in an acute necrotizing inflammatory background characterized by necrotic debris (white arrow).

Additional immunohistochemical stains revealed positivity for thyroid transcription factor-1 and carcinoembryonic antigen and negativity for cytokeratin 5/6. The histopathological and immunohistochemical stains suggested a diagnosis of metastatic lung adenocarcinoma. The patient denied further adjuvant chemotherapy and took gefitinib (250 mg) orally once a day at his own expense. The postoperative course was uneventful, and the patient showed good recovery without tumor relapse over 12 months.

DISCUSSION

An empyema is a collection of pus within a pleural space, and it is often a complication of pneumonia. *K pneumoniae* is the major cause of thoracic empyema or complicated parapneumonic effusion in patients in Taiwan. It is an independent risk factor for fatal outcome with 32.4% mortality (3). The risk factors that cause *K pneumoniae* infections are liver cirrhosis, diabetes mellitus and bronchogenic carcinoma (3). Empyema associated with primary lung cancer is rare, and its incidence ranges from 0.1% to 0.3% (2, 4). It may be considered to be associated with natural complications of cancer, immunosuppression status, consequences of pneumonia and necrotic tissue following chemoradiotherapy or invasive procedures (5). The empyema was treated with thoracic drainage, infection control and optimized nutrition (6). However, the management of lung cancer complicated with a thoracic empyema in an older patient remains a challenge. A few cases of adenocarcinoma-associated empyema have been reported previously, but the origin of the adenocarcinoma remains unknown (7–9). Some chest radiographic findings, such as new air-fluid levels, destruction of bone, soft tissue bulges in the chest wall and increased dens-

ity in the thoracic cavity, can be suspicious of malignancy (7, 9). Further studies of the pleural fluid should be conducted, including erythrocyte/leukocyte counts, gram staining, cultures, and cytological examinations (5). Although the symptoms and laboratory tests all indicated the empyema preoperatively, a biopsy specimen showed metastatic adenocarcinoma of the lung in our case. It is difficult to make such a diagnosis preoperatively, and prognoses are significantly worsened when metastasis is found (5, 10). Positron emission tomography-CT imaging has been reported to be helpful in determining the extent of tumour and in surgical planning (9). Treatment of lung cancer-associated empyema first targets the empyema, and surgical interventions can improve the quality of life in selected patients (5). Before surgery, immediate drainage and systemic antibiotic therapy should be performed to control infection (11). After decortication of the empyema cavity, proper positioning of the chest drainage with video-assisted thoracoscopic surgery can improve the condition (1). The presentation of carcinoma-associated empyema is rare. Such a condition causes significant diagnostic problems, and appropriate therapy is often delayed. Physicians should be aware of the possibility of lung cancer associated with thoracic empyema caused by *K pneumoniae* in older patients.

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