

Complete Pleuropneumonectomy for Non-Small Cell Lung Cancer Complicated with Chronic Bacterial Empyema and Cavitory Pulmonary Tuberculosis

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Abstract : A 62-year-old man was given a diagnosis of primary lung cancer in the right lower lobe with chronic bacterial empyema and cavitory tuberculosis in the right upper lobe. He underwent complete pleuropneumonectomy. Pathological examination revealed that the tumor was pT2N1M0 squamous cell lung cancer. There was no direct communication between the neoplasm and free pleural cavity microscopically. The empyema might have occurred secondary to obstructive pneumonia caused by the tumor involvement of the lower respiratory tract. The empyema microbe was identified as staphylococcus aureus (MSSA). Mycobacterium tuberculosis was detected from the cavitory lesion of upper lobe. His clinical course was good and no recurrence of lung cancer, empyema or pulmonary tuberculosis has been detected at 20 months after the operation.

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Key words : Non-small cell lung cancer, Pulmonary empyema, Cavitory tuberculosis, Pleuropneumonectomy

Background

The incidence of primary lung cancer with empyema is 0.1%¹⁾ to 0.3%²⁾ of the patient who had been under the surgical or the conservative treatment. Report of surgical resection of lung cancer accompanied by empyema are rare. There may be some difficulty in radiologically diagnosing these cases. We performed complete pleuropneumonectomy on a non-small cell lung cancer (T2) complicated with bacterial empyema and cavitory pulmonary tuberculosis in another lobe of the ipsilateral lung.

Case

A 62-year-old man have a moderately productive cough and low-grade fever for 4 months prior to admission. He did not want to have any medical treatment, but finally visited our hospital because his symptoms progressively

Fig. 1. Chest X-ray on admission shows pleural effusion in right lower lung area and a small cavitory lesion in right upper lobe.



worsened. He complained of easy fatigue, dyspnea on effort and occasional bloody sputum. Chest X-ray examination revealed right pleural effusion above the minor fissure of the right lung field and a cavitory lesion in the right upper lobe of the lung (Fig. 1). Computed tomography revealed a nodular lesion in the parenchyma of the

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Fig. 2. Chest computed tomography reveals a cavitory lesion situated in apex of the right lung A) and a nodular lesion, in the right lower lobe. Parapneumonic effusion with thick fibrous wall is loculated and expand above minor fissure of the right lung B)

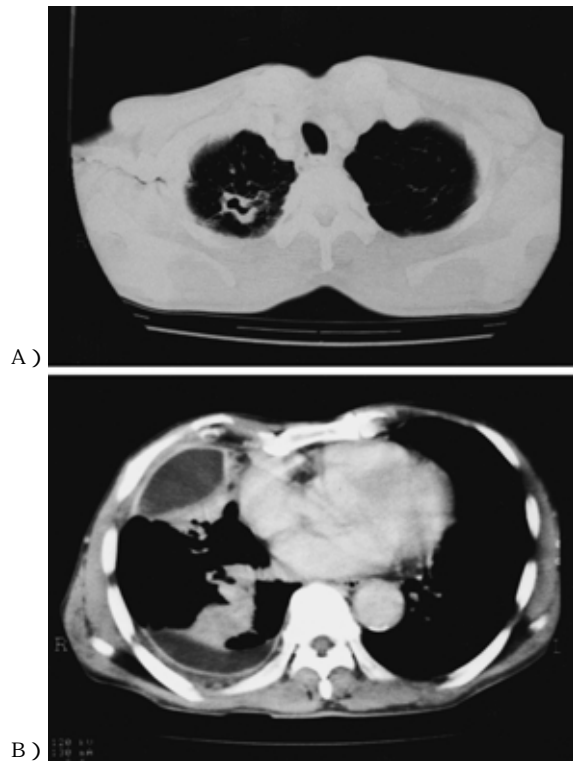


Fig. 3. A right posterolateral incision is made and extended as an S curve.

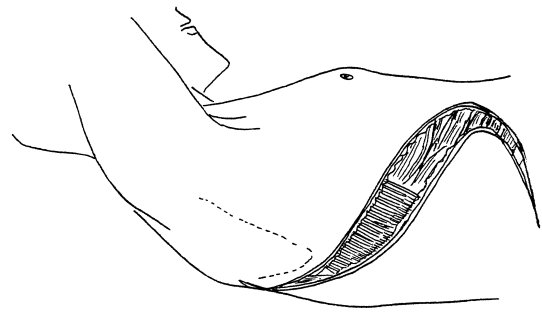


Fig. 4. The whole lung is dissected extrapleurally.



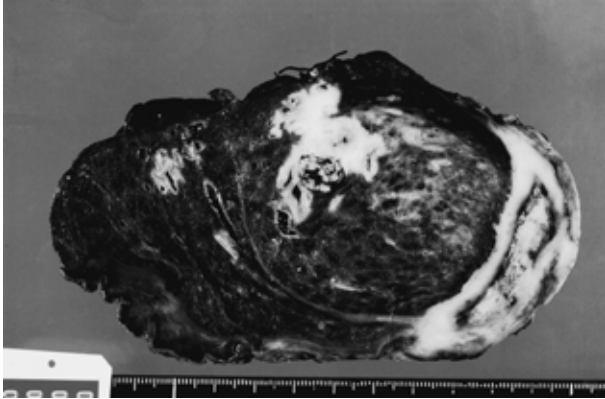
right lower lobe, pleural effusion with thick fibrous wall and an inflammatory nodular lesion with a cavity surrounded by micronodules in the apex of the right lung (Fig. 2) Leukocytosis and a high CRP level were showed in the laboratory data. No serum tumor makers were elevated. The preoperative vital capacity was 1960 ml (%VC 59.2%), and the forced expiratory volume in one second (FEV1.0) was 1590 ml. Fiberoptic bronchoscopy revealed that the right basal bronchus was occluded by tumor which invaded to the spur between the middle lobe and lower lobe bronchi. The middle lobe bronchus was grossly encased by the extrabronchial lesion. Transbronchial lung biopsy showed that the lower lobe nodule was primary non-small cell lung cancer and the upper lobe cavitory lesion was pulmonary tuberculosis.

He underwent complete pleuropneumonectomy on June 17 1998. Under general anesthesia, with the patient in the left lateral position, a right posterolateral incision was made and extended as an S curve to make two thoracotomy in the right side (Fig. 3). The sixth rib was removed subperiostally and usual thoracotomy was made.

The whole lung was removed from the chest wall extrapleurally to prevent the contamination of pus from the empyema(Fig. 4) A thick fibrous empyema cavity had developed with loculations. The middle and lower lobes were collapsed due to the empyema. The thick fibrous cavity of empyema was dissected carefully from the diaphragm through the eighth intercostal space. An soft elastic nodule, 3 cm in diameter, was detected in the apex of the right upper lobe after the extrapleural dissection of the whole right lung. The right main pulmonary artery and veins were separated with vascular staplers. The right main bronchus was amputated with staplers. Then the whole lung and empyema were removed from the chest. The systematic node dissection of the hilar nodes and the mediastinum was performed. After a large amount of saline irrigation(10,000 ml) the bronchial stump was coated only with fibrin glue. Two chest drainage tubes were introduced through the intercostal space and the chest was closed in the usual manner.

The tumor involved the lower lobe bronchus with distal

Fig. 5. The tumor involving the lower lobe bronchus with distal obstructive pneumonia. The tumor was seen as a rounded nodule, approximately 3.5 cm in diameter without direct communication between the tumor and the pleural cavity. The thick fibrous empyema cavity with loculations formed around the lower lobe and the middle lobe of the right lung.



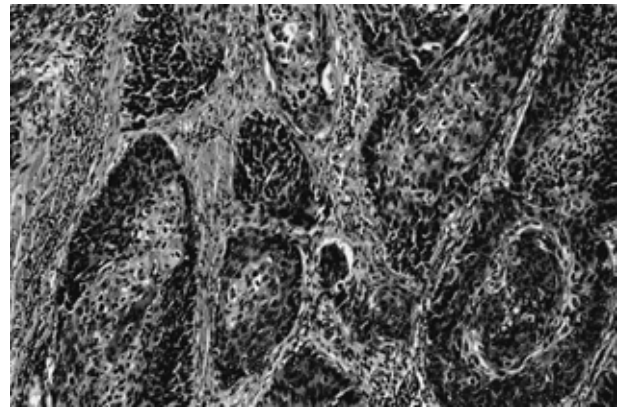
widespread obstructive pneumonia which was adjacent to the empyema cavity. The tumor was seen as a rounded nodule, approximately 3.5 cm in diameter. There was no direct communication between the tumor and the pleural cavity (Fig. 5). The histological diagnosis was moderately differentiated squamous cell carcinoma with hilar node metastasis surrounded by loculated bacterial empyema thoracis. Postoperative TNM evaluation was p-T2N1M0, p-stage IIB (Fig. 6). The cultures identified the empyema microbe as staphylococcus aureus(MSSA). There were no recurrence of cancer, bacterial empyema or pulmonary tuberculosis despite no specific medication 20 months after surgical treatment.

Conclusion

Surgical treatment for lung cancer accompanied by empyema is rare¹⁾⁻⁴⁾. It is reported that the incidence of lung cancer with empyema is 0.1%¹⁾ to 0.3%²⁾ of the clinical patients. Diseases, such as lung cancer, bacterial empyema and cavitory tuberculosis, are not rare. Aggressive surgical treatment for these three sequels, however, is not reported in the paper.

Almost all of the patients who had lung cancer accompanied by empyema are markedly advanced cases^{1),3),5)}. Furthermore, it is difficult to diagnose primary lung cancer with parapneumonic empyema radiologically^{2),5)}. Besides, it takes long period to estimate the malignant disease. Moreover, parapneumonic empyema makes it difficult to evaluate the tumor size, the presence of lymph-

Fig. 6. Histological findings of the resected tumor showing moderately differentiated squamous cell carcinoma



adenopathy or other information concerning the thoracic cavity.

The treatment for the active empyema requires a long hospitalization¹⁾⁻³⁾. Furthermore, in this case the empyema could not be controlled without removal of the cause : obstructive pneumonia, tumor perforation. Most patients with lung cancer complicated by active empyema with receiving conservative therapy have extremely poor prognosis^{1),3),5)}. Therefore, surgery for lung cancer and empyema may be one of the most effective methods to treat these sequels simultaneously^{1),3)}.

In our case, there was no direct communication between the tumor and the pleural cavity microscopically. There might not be the episode of tumor perforation to free pleural cavity. The empyema might have occurred secondary to the widespread distal obstructive pneumonia caused by the tumor involvement of lower respiratory tract.

Another significant aspect of our case is that the patient had cavitory tuberculosis in the right upper lobe. Retrospective review of annual chest X-ray surveys revealed that he did not have pulmonary tuberculosis two years prior to admission. His cavitory tuberculosis may have been related to the development of some malignant disease. The incidence of pulmonary tuberculosis tends to increase in compromised hosts⁶⁾. The sequel of pulmonary tuberculosis may progressively worsen, presumably owing to immunosuppression, which could be caused by lung carcinoma and more invasive surgical treatment. Infectious chronic empyema and cavitory tuberculosis may require the long period for treatment. Therefore, his lung cancer should be resected along with cavitory tuberculosis and the active infectious chronic empyema simultane-

ously for avoiding past saving. It has been reported that pneumonectomy through the pleural cavity is a high-risk procedure in infectious disease⁷⁾ because of the damage of the recurrence of empyema. We adopted the method of complete panpleuropneumonectomy to prevent from the

contamination in the pleural space.

Thus, our patient has enjoyed an uneventful postoperative convalescence without specific treatment for pulmonary tuberculosis, empyema or non-small cell lung cancer for 20 months after the operation.

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