



Bronchial Sleeve Resection for Lung Cancer Preoperative Empyema

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Authors' contributions

This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Surgical management of the cancer with empyema has rarely been reported in the literature because few of such cases are operable. Many patients might be misevaluated because of the incorrect staging associated with an acute or sub-acute infection. Even in the presence of an operable tumor mass; surgeons behave timid to these patients because of the possibility of infective postoperative complications. The balance between expected benefits and possible risk of surgical intervention is also important. If it is indicated, by the time pleural empyema is restored, procedures such as resection and even bronchoplasty should be performed.

59-years old patient with squamous cell carcinoma that completely obstructed left basal segments and caused to empyema. A thoracic catheter was inserted. Multiple pleural irrigations were done and proper antibiotherapy. Pathologic diagnosis of pleural fluid and pleural biopsy were benign. Pleural cultures were negative and amount of empyema fluid volume has decreased within two months. Positron emission tomography (PET) revealed a 2.5 cm sized left infrahilar tumor, right paratracheal, prevascular and subcarinal lymph nodes and non-homogeneous increased pleural activity. Mediastinal lymph nodes were evaluated as reactive with mediastinoscopy. Left lower lobectomy and lingulectomy were performed with bronchial resection and pathologic stage was 2A (T1bN1MO).

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1. INTRODUCTION

Empyema, a frank pus accumulating in the pleural space, is not a common complication reported in primary lung cancer patients; as it is notified to range from 0.1 to 0.3% [1,2]. Therefore, the surgical management of the condition has rarely been reported for only a few of these cases were operable.

2. CASE

A 59 year-old male was admitted to our clinic with the complaints of cough and dyspnea.

He had a history of smoking 40 pack-years and had a coronary stent due to his coronary artery disease. On physical examination, he had decreased Breath sounds at left lower zone. Chest x-ray revealed pleural effusion and pleural thickening involving the left hemithorax. On PET CT, a 2.5 cm left hilar tumor (with SUV; 10.9), right paratracheal, prevascular and subcarinal lymph nodes (with SUV 4.5, 4.4, 5.7 respectively) and non-homogeneous increased pleural activity (SUV 5.5) was demonstrated. The patient has undergone tube thoracostomy; in the examination of pleural fluid, it was detected that it had the characteristics of empyema. Thorax computed tomography (CT) showed loculated massive pleural fluid, multiple mediastinal and left hilar lymphadenomegalies and obstructive collapse of the left lower lobe (Fig. 1). Subsequently, bronchoscopy was performed and the obstruction of basal segments with a lobulated partial necrotic mass was demonstrated. *Staphylococcus aureus* was isolated from the pleural fluid. Multiple pleural irrigations were done and proper anti-biotherapy (Sultamicillin 1 gr 4X1 IV) was applied as treatment, intravenously.

On pathologic examination with the H&E staining; tumor cells demonstrated the features of squamous cell carcinoma (ca) whereas pleural fluid and pleural biopsy were benign. Most of the pleural loculations were drained by tube thoracostomy; but pleural thickening and left lower lobe collapse persisted (Fig. 2). Pleural cultures were negative and amount of empyema of fluid volume was diminished in two months.



Fig. 1. CT showed loculated massive pleural fluid, multiple loculations, mediastinal lymph nodes and lower lobe atelectasis before the treatment of empyema



Fig. 2. Massive pleural fluid regressed, pleural loculations, thickening and lower lobe atelectasis were remained following chest tube and pleural irrigations

On frozen section, premediastinal lymph nodes resected by mediastinoscopy were evaluated as reactive lymph nodes. As to the results; for his lung cancer settled at the left inferior bronchus, we have performed inferior lobectomy. Among the operation, it was seen that lingular segmental bronchi were originated from the left main bronchus as a variation. They were settled near the tumoral tissue. Left lower lobectomy and lingulectomy were performed with bronchial resection and the remaining apicoposterior segmental bronchus was anastomosed to the left

main bronchus (Fig. 3). Operation was terminated with parietal pleurectomy and mediastinal node dissection.

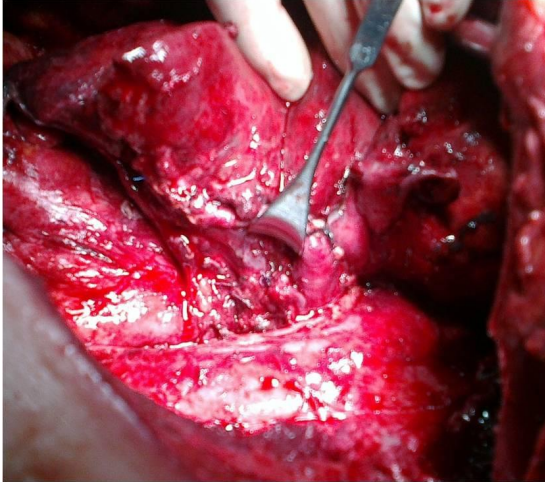


Fig. 3. Left apical and posterior segments were seen after bronchial anastomosis

The pathological examination demonstrated a 3 cm tumoral lesion with lymphovascular/ bronchial cartilage invasion. However the surgical margins were negative for tumor cells. As to TNM classification, the pathological stage was coherent with 2A (T1bN1MO).

At the end of the first year of the follow-up, another tumor was observed at the right upper lobe and sublobar resection was performed. Histological type of the second tumor was adenocarcinoma and its pathological stage was 1b. Unfortunately, case is still taking his 3th series of chemotherapy since then.

2. DISCUSSION

Lung cancer complicated with pleural empyema has been reported as a rare condition, but a challenging one. The main cause of empyema in lung cancer patients might possibly be attributed to obstructive pneumonia progressing to pulmonary abscess and consequent empyema [3].

As the lung cancer does, empyema or any other pulmonary infection may provoke hilar or mediastinal lymphadenomegalies by triggering inflammatory processes.

The examination methods used for staging the cancers do demonstrate these lymphadenomegalies; and it compels the

clinicians to distinguish which ones are due to the cancer itself and which ones are secondary to an infection. PET CT, one of the imaging methods used while staging, is not a trustworthy test in discriminating reactional lymph nodes.

In our opinion, many patients might be misevaluated because of the incorrect staging associated with an acute or sub-acute infection. This theory might explain the reason of the rarity of the post-infectious lung-cancer operations.

Additionally, this theory leads to the question about reactional lymph nodes. Do they actually regress due to the chemotherapy or infact they were secondary to the infection just from the beginning?

Acute empyema is generally managed by a combination of thoracic drainage and antibiotic therapy. The exact elective time of surgery is usually the period immediately after the recovery [3]. This strategy is based on the fact that surgical resection in the presence of a severe thoracic infection brings high risks of postoperative complications.

The intricacy mentioned above creates an inhibited approach to such patients. First and foremost; undertaking such a suspicious cause into a surgical procedure is hazardous and makes the surgeon anticipate that the margins might possibly be positive for tumor cells. This risk may have been reduced by preoperative mediastinoscopy and pleural biopsies.

Even in the presence of an operable tumor mass; surgeons behave timid to these patient because of the possibility of infective postoperative complications; atelectasis, pneumonia, empyema or bronchopleural fistula caused by erosion of suturelines per infection.

Functional lung parenchyma can be consumed; the re-implanted lobes contribute to postoperative quality of life. However, bronchial anastomotic complications and operative mortality rates show considerable variation across studies [4,5].

The major complications after a sleeve resection are the stenosis of the bronchoplasty site and atelectasis. The incidence of anastomotic dehiscence is estimated to be at approximately 3.5% [6]. A prior or underlying infection such as empyema could trigger the dehiscence and cause bronchopleural fistula. We have performed

our surgery when sterility of the cavity has been provided and did not run with such a complication.

3. CONCLUSION

The balance between expected benefits and possible risk of surgical intervention is also important. If it is indicated, by the time pleural empyema is restored, procedures such as resection and even bronchoplasty should be performed.

CONSENT

All authors declare that 'written informed consent was obtained from the patient for publication of this case report and accompanying images.

ETHICAL APPROVAL

All authors hereby declare that the study performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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