Case Report

Large cell carcinoma on the bullous wall detected in a specimen from a patient with spontaneous pneumothorax: report of a case

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Abstract: Bullous emphysema has been proven to be an important risk factor for lung cancer. Some reports have described pneumothorax caused by rupture of an emphysematous bulla, following which cancer is found in the resected specimen. A 72-year-old male patient was referred to our hospital because of dyspnea and high fever. Chest radiography and computed tomography (CT) revealed right pneumothorax and emphysematous bullae. There was also effusion in the bullae and thoracic cavity. Based on the diagnosis of pneumothorax and a lung infection associated with bullous emphysema, we resected the bullae. Pathological examination of the specimen revealed a mass and large cell carcinoma.

Keywords: Pneumothorax; primary lung cancer; bullas emphysema; large cell; carcinoma

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Introduction

Bullous emphysema has been proven to be an important risk factor for lung cancer. Lung cancer, however, is rarely found during surgery for pneumothorax. In the reported case, lung cancer was incidentally discovered after the patient underwent surgery because of pneumothorax. We report a large cell carcinoma on the bullous wall detected in the specimen resected during an operation for spontaneous pneumothorax.

Case

A 72-year-old male patient with emphysema was admitted to our hospital complaining of dyspnea. He was found to have a high fever. The previous history of the patient was not significant. Chest radiography showed infectious bullae and pneumothorax as well as infectious effusion in the bullae (*Figure 1*). Computed tomography (CT) of the chest revealed bullae on the right upper lobe (*Figure 2*). We performed chest drainage, finding serous fluid and air in the drainage tube, removing them. Although chest drainage was instituted, the patient continued to have a persistent air leak. Furthermore, the intracystic infection did not diminish. Therefore, we performed a right upper lobectomy because the bullae had spread over almost all of the right upper lobe. The postoperative course was uneventful, and the patient was discharged on the 6th postoperative day.

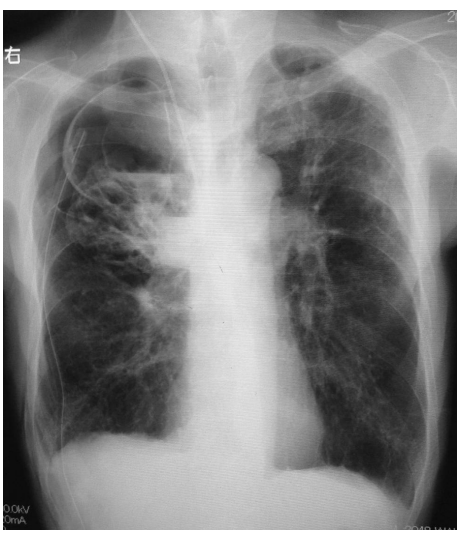

Figure 1 Chest radiography after chest drainage shows a bulla and intra-bulla fluid in the right upper lung field.

The pathological specimen contained a tumor that had developed from the thickened wall of a bulla (*Figure 3A*). The postoperative pathological diagnosis was large cell carcinoma arising from the wall of a bulla (*Figure 3B*).

Discussion

Bullous emphysema is an important risk factor for lung cancer (1-4). The incidence of lung cancer associated emphysematous bullae has been reported to be 6.1%, which was times higher than that for patients without bullous disease (1). There are three possible explanations for lung cancer arising in a patient with bullous emphysema: (I) an occult cancer that has been present for some time, causing accumulation of material in the bullous area; (II) cancer arising from an area of squamous metaplasia; (III) cancer arising from a scar on the bullous wall (5).

Histologically, poorly differentiated adenocarcinoma and large cell carcinoma are most common. The prognosis is poor for each (6). It is rare that lung cancers are detected via the spontaneous pneumothorax (7,8). Cases of lung cancer whose first symptom is spontaneous pneumothorax are rare, having been reported in fewer than 1% of cases (9).

In this case, the patient was admitted to our hospital because of spontaneous pneumothorax. We performed surgery on him to resect bullae that exhibited air leakage or contained infectious fluid. During the operation, we could see the bullae spreading over almost all of the right upper lobe, so we decided to change the operation to right upper lobectomy. During the operation the cancerous lesion was not macroscopically evident. Fortunately, we completed the resection so it included removal of the occult cancer that was found later in the resected specimen. In medical practice, we see many patients with spontaneous pneumothorax caused by rupture of emphysematous bullae. Although our first thought is that the disease is probably caused by a weakened lung surface, we must not lose sight of the possible existence of cancer. Also, at the time of lung collapse it is common that various examinations (e.g., radiography and CT of the chest) indicate that the part of the lung that has collapsed has a nodular appearance. Thus, it is possible to misread the results of those examinations. Additionally, tumor associated with a lung cyst is almost always located in the distal portion of the lung. Hence, in most patients there are no symptoms that could be attributed to a cancer. This point makes it more difficult to suspect and then detect a tumor (5).

Figure 2 Chest computed tomography shows bullae spread over almost all of the right upper lung lobe.

Conclusions

We reported a case of lung cancer detected in the operative specimen from a patient with diagnosed pneumothorax. Cases of lung cancer in which the first symptom is spontaneous pneumothorax are rare. Bullous emphysema, however, has been proven to be an important risk factor for lung cancer. It is therefore important to keep in mind the possible occurrence of lung cancer in the walls of bullae.

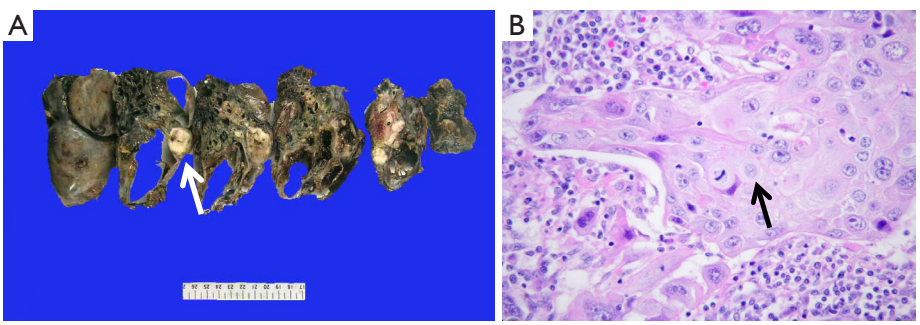

Figure 3 (A) Cut surface of the resected right upper lobe discloses a well-demarcated tumor nodule measuring 5.0 cm in greatest diameter. It is closely associated with bullous cystic lung tissue; (B) histological sections reveal solid nests of large cell carcinoma (×600).

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