Cavitary lung cancer presenting as subcutaneous emphysema on the contralateral side

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Abstract

Bronchocutaneous fistula is an extremely rare complication of lung cancer and is frequently seen following biopsy or radiotherapy. A 67-year old male patient was administered to our hospital due to sudden onset of shortness of breath and subcutaneous emphysema on the right side. Chest computed tomography revealed a cavitary lesion in the left upper lobe in connection with the subcutaneous emphysema on the right side through sternum and anterior chest wall. The pathological examination of the biopsy performed during tube insertion revealed a well-differentiated squamous cell carcinoma of the lung. The patient was referred for adjuvant therapy to local oncology hospital. He passed away 9 months following diagnosis.

Keywords: Fistula • Bronchosubcutaneous • Lung neoplasms • Complications

INTRODUCTION

Bronchocutaneous fistula is an extremely rare complication of lung cancer and is the extended version of a bronchopleural fistula, a direct communication between the pleura and bronchial system or the lung parenchyma \cite{1}. Most bronchopleural fistulae are postoperative complications of surgical resections of lung, secondary to chemotherapy, radiation treatment, chronic inflammation or infection or a result of internal or external chest trauma \cite{1,2}. We report on a case of bronchocutaneous fistula leading to contralateral subcutaneous emphysema in a lung cancer patient.

CASE REPORT

A 67-year old male patient was referred to our emergency department due to a sudden shortness of breath and subcutaneous emphysema on the right side. He was thought to have spontaneous pneumothorax following chest X-ray and was sent for tube thoracostomy (Fig. 1). He had difficulty in breathing, needed O\textsubscript{2} supplement, and was in a sitting position for better ventilation. He had crackles all around his right hemithorax, extending to the neck. The breath sounds, however, could be heard on both sides. From medical history, we found out that the patient had been a smoker since he was 12 years old, and smoked 1–1.5 packs/day. We also learned that the patient had a lung lesion in the left upper lobe and refused to have a biopsy taken for two years. Chest computed tomography (CT) scan revealed a cavitary lesion in the left upper lobe in connection with the subcutaneous emphysema on the right side through the sternal soft tissue and anterior chest wall (Fig. 2). A 28 Fr bore chest tube was inserted into the cavity in the left upper lobe under local anaesthesia following punch biopsy. There was only a mild air leak that stopped on the second postoperative day. The pathological examination revealed a well-differentiated squamous cell carcinoma of the lung. According to the 7th edition of TNM, the patient was evaluated as cT3N0M0 and was offered surgical resection for local control. As the patient refused to have an operation, he was offered a chemical pleurodesis to prevent air leak recurrences. However, the patient refused any further measures and was referred to his local Oncology Hospital for chemotherapy and/or radiation treatment. Unfortunately, the patient passed away 9 months following diagnosis. He did not have another episode of air leak during this period.

DISCUSSION

Bronchopleural fistulas may be seen in 2–13% of patients after surgical resection of lung \cite{1,2}. Most postoperative bronchopleural fistulas are the result of ischaemia of lung parenchyma due to infection, chemotherapy, radiation treatment or poor condition \cite{1,3}. The fistula develops by direct tumour extension or pulmonary inflammation and tissue necrosis secondary to chemotherapy or radiation treatment \cite{3,4}. Bronchocutaneous fistulas are even less common and are believed to have a similar spectrum of etiology, i.e. previous surgery and/or infection. Rarely, they may be secondary to a primary neoplasm invading the chest wall with or without infection \cite{4–7}. Our case did not have any sign of acute infection, did not have a history of chemotherapy or radiation treatment as he did not have a diagnosis of lung cancer before admission to our hospital.
Iyer et al. recently reported a 62-patient series of pneumomediastinum and subcutaneous emphysema \[8\]. In their study, the underlying cause was primary or metastatic lung malignancies in four patients (6%). Borquero-Romero and Redondo-Moralo searched through databases and reported a review of eight cases of spontaneous pneumomediastinum \[9\]. In all except one, the cases had subcutaneous emphysema, as well. Only three of the cases did not have a history of chemotherapy or radiation treatment. Of these three cases, one had undifferentiated non-small cell carcinoma in carina, one had a metastatic cystic angiosarcoma and the other had large cell carcinoma. Our patient had well-differentiated squamous cell carcinoma.

It is well stated that chest X-ray is usually sufficient for diagnosis. CT is the diagnostic test of choice for visualization, localization and diagnosis of bronchial fistulae \[4, 5, 7-9\]. Chest X-ray of our patient suggested pneumothorax on the right side. Due to uncoordinated clinical and X-ray findings, we ordered a chest CT scan in our patient that revealed the cavitory lesion and subcutaneous emphysema on the contralateral side. This may be due to a possible previous TB infection without diagnosis leading to pleural symphysis on the left side.

In previous reports about the situation possible treatment steps include: bed rest, intermittent oxygen therapy, analgesics, antitussive medications, corticosteroids for asthmatic subjects, sedatives and drainage of subcutaneous air \[8\]. We believe that surgical resection of the tumour may be added to this in locally advanced cases with a cN0M0 status. Despite maximal effort, unfortunately, the prognosis is still not favourable.

We conclude that a malignant cavity invading the chest wall may lead to subcutaneous emphysema without pneumothorax or pneumomediastinum, even on the contralateral side of the lesion, leading to misdiagnosis. This may be due to a possible previous inflammation, i.e. TB infection, leading to pleural symphysis on the affected side. Although chest X-ray is very informative, sometimes it may be better to use the chest CT for further information. Although conservative treatment is suggested, we believe that treatment steps should include surgical resection in suitable patients.

**Conflict of interest:** none declared.

**REFERENCES**