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Case Report

Radiology Section

Transthoracic Biopsy Causes Massive Subcutaneous Emphysema in a Low Risk Patient

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ABSTRACT

Subcutaneous Emphysema (SE) can be defined as air leakage under skin from the respiratory or gastrointestinal system. It is frequently accompanied by pneumomediastinum. Thoracentesis, image-guided lung biopsies, pulmonary diseases and therapies resulting in necrosis can cause this pathology. The risk of pneumothorax and SE increased with the distance of the lesion to the pleura, and small size of the lesion. Although, our patient had low risk for SE, there were minimal pneumothoraces and massive SE. We consider that tumour necrosis and subcutaneous tissue may be related via transthoracic biopsy and this leads to massive SE.

Keywords: Emphysema, Lung cancer, Pneumothoraces

CASE REPORT

A 69-year-old male patient complained of dyspnoea, cough, and fatigue since one month. On physical examination respiratory rate was 26/minute, blood pressure 140/85mmHg and pulse rate 82/minute. Percussion determined submatity in the middle lobe of the left hemi-thorax on auscultation. In the chest radiography [Table/Fig-1], there was a space-occupying lesion in the left hilus. Spirometry results were Force Expiratory Volume 1= 69, and Force Expiratory Volume 1/Force Vital Capacity = 95. A non-contrasted CT thorax was performed one day later, it was observed that a mass with 8.9 cm diameter was located in the left hilus of the lung, and a minimal pneumothorax was determined at the inferolateral part of left hemithorax. The patient refused bronchoscopic biopsy so transthoracic biopsy was performed. After transthoracic biopsy, broncoscopy was performed. The histopathologic report confirmed it as squamous cell carcinoma. Four days after the transthoracic biopsy, swelling started in the posterior part of the body and expanded progressively. After seven days of biopsy, Positron Emission Tomography/Computed Tomography imaging was done for staging of primary mass, which detected necrosis in the middle of tumour [Table/Fig-2]. It also revealed, minimal pneumothorax in the left hemithoraces and massive subcutaneous emphysema extended in bilateral neck region [Table/Fig-3], left side of the body and it sprawled up to L4 vertebral level in the left side. So, final diagnosis was lung cancer and transthoracic biopsy related massive SE. Patient refused for the lung cancer treatment and died three months after the diagnosis.

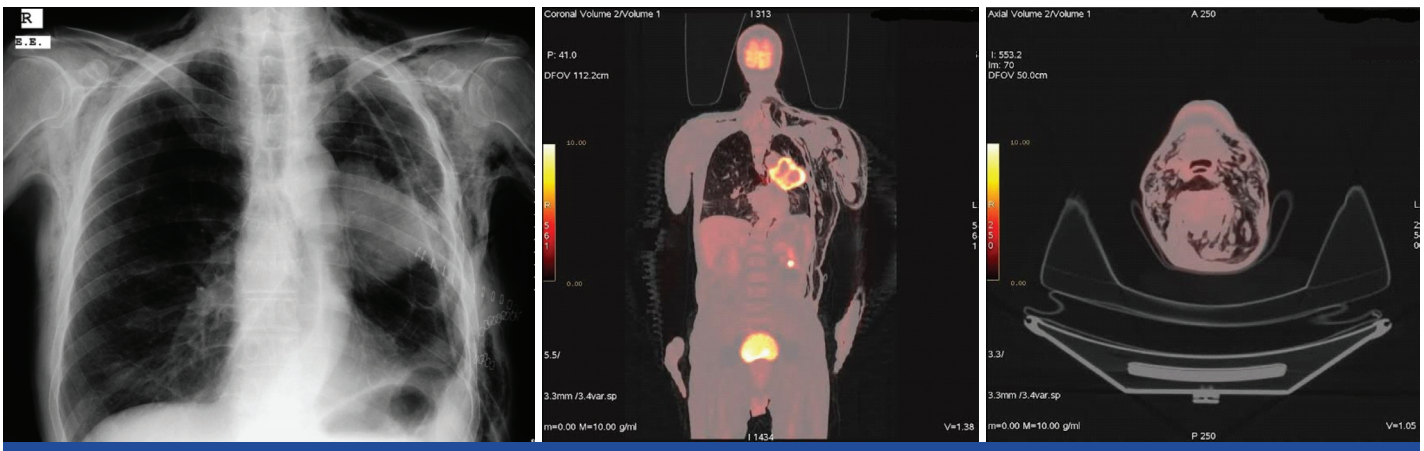
DISCUSSION

PET means using positron emitting radiopharmaceuticals for imaging purposes. In PET studies, the most commonly used radiopharmaceutical is 2-fluoro-2-deoxy-D-glucose (18 F-FDG) and is based on the principle of high glucose consumption by malignant cells. Mostly CT component is added to PET devices for attenuation correction and anatomic localization. PET/CT is widely used for cancer staging including lung cancer [1,2].

Alveolo-pleural fistula is defined as an abnormal connection between the airways and pleural space [3]. Bronchocutaneous fistula is the direct connection between bronchial system and skin, and it is generally a rare complication of lung cancer [4]. Reports indicate that if there is a rupture in alveola, air leakage reaches to pulmonary interstitial tissue and then to perivascular space and pleura. If air passage exceeds pleural reabsorption capacity, SE may occur [5-7].

Thoracentesis, image-guided lung biopsies, pulmonary diseases and therapies resulting in necrosis can cause this pathology [3,4,8,9].

Aktas AY et al., suggested that 28.7% pneumothorax and 2.1% SE were developed after CT-guided biopsy procedure [10]. Meregildo et al., reported that after the percutaneous pulmonary biopsy, pneumothorax and SE may emanate [5]. Zheng A et al., reported concomitant massive SE in two patients with large pneumothorax [11]. The risk of pneumothorax proportionally increased with the distance of the lesion to the pleura [12], and



[Table/Fig-1]: Chest radiography showing space-occupying lesion in the left lung (hilus). **[Table/Fig-2]:** Necrosis in the middle of primary lung carcinoma in left lung. **[Table/Fig-3]:** Emphysema in bilateral subcutaneous neck tissue.

the small size of the lesion [10,13]. In a study published in 2014, it was reported that tumour necrosis together with pleural adhesion might cause fistulization between the lung and subcutaneous tissue and finally result in massive subcutaneous emphysema and minimal pneumothorax [14]. Yalçınkaya et al., reported that cavity in tumoural tissue might cause SE without causing pneumothorax and pneumomediastinum [15]. There are some other studies in the literature reporting that there could be a relationship between tumour necrosis, pneumothoraces and SE [16-18].

In our case, it could have been expected that pneumothoraces and SE development risk was minimal because the lesion was large and near the pleura (approximately 10 mm distance) [10,12,13] however, it was not. We believe that tumour necrosis and subcutaneous tissue could be related with transthoracic biopsy and this led to massive SE and minimal pneumothoraces.

CONCLUSION

Massive SE and pneumothoraces may occur because of transthoracic biopsy if tumour has necrosis. These complications should be considered in patients who have necrotizing tumour even in low risk patients.

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