

Parenchymal-Subcutaneous Fistula without Pneumothorax: A Rare Complication of Chest Drain Placement

Fístula Parênquimo-Subcutânea sem Pneumotórax: Uma Complicação Rara da Colocação de Dreno Torácico

Keywords: Bronchial Fistula/complications; Chest Tubes/adverse effects; Cutaneous Fistula/complications; Drainage/adverse effects

Palavras-chave: Drenagem/efeitos adversos; Fístula Brônquica/complicações; Fístula Cutânea/complicações; Tubos Torácicos/efeitos adversos

Dear Editor,

A fistula is a pathological communication between two structures, usually deriving from iatrogenic causes, infections, or trauma. In the thorax, bronchopleural or alveolar-pleural fistulas are probably the most common,¹ leading to pneumothorax due to the establishment of air flow between the bronchus or parenchyma (respectively) and the pleural space. They can originate a persistent air leak that lasts for five to seven days.² A bronchocutaneous fistula, with only a small number of cases reported in the literature,³⁻⁵ represents a communication between a bronchus and the cutaneous tissue, usually resulting from chest drain placement.

Considering this, one could conceptualize a fistula between the lung parenchyma and the subcutaneous tissue, which would lead to subcutaneous emphysema but no pneumothorax. To the best of our knowledge, such a process has never been described.

A 56-year-old female patient with stage IV lung adenocarcinoma was admitted for sudden dyspnea. A chest computed tomography (CT) scan revealed a right secondary spontaneous pneumothorax, and an 18 French chest tube was inserted by the emergency room team, with partial lung re-expansion but continuous air leak. Four days later, the patient developed subcutaneous emphysema. Due to a suspected de-positioning of the chest tube, a new 22

French chest tube was placed in the same location, despite no subsequent improvement.

Bronchoscopy excluded bronchial fistulas or lacerations, prompting video-assisted thoracoscopic surgery that found and repaired a pulmonary laceration on the right upper lobe. Talc poudrage (spraying of talc on the pleural surface during thoracoscopy in order to induce pleurodesis) was performed, and two new chest tubes (28 French and 24 French) were placed. Initial improvement was observed until the third postoperative day, when severe subcutaneous emphysema recurred, spreading to the thorax, abdomen, inguinal region, and face, despite no oscillation or bubbling in the chest tubes.

A new chest CT revealed a fistulous tract between the lung parenchyma and the subcutaneous tissue on the first chest tube location, with no pneumothorax. The patient underwent rethoracotomy to seal the fistulous tract with Tisseel® (a fibrin tissue adhesive) and placement of two new chest tubes (28 French). Total resolution of subcutaneous emphysema ensued, and the chest tubes were removed after five days.

This case reflects the possibility of parenchymatous fistulas to the subcutaneous tissue as a complication of chest tube placement. It underscores the importance of the multidisciplinary approach, involving intensivists, bronchologists, thoracic surgeons, and radiologists. The chest CT was pivotal in allowing the development of a pathophysiological model to understand the cause of the subcutaneous emphysema and the planning of an effective intervention with a favorable outcome.

AUTHOR CONTRIBUTIONS

AN, FF: Study design, data acquisition and analysis, writing and critical review of the manuscript.

DC, FS, FFe: Study design, data analysis, critical review of the manuscript.

All authors approved the final version to be published.

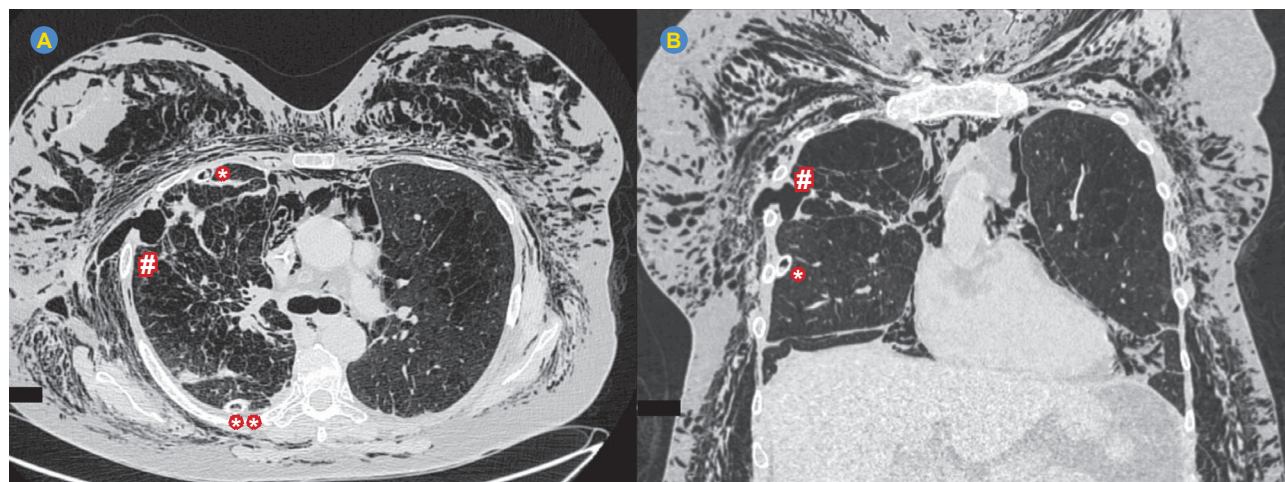


Figure 1 – Chest CT revealing the two chest tubes placed during the first surgical intervention (* and **) as well as a fistulous tract between the lung parenchyma and the subcutaneous tissue (#)

PROTECTION OF HUMANS AND ANIMALS

The authors declare that the procedures were followed according to the regulations established by the Clinical Research and Ethics Committee and to the Helsinki Declaration of the World Medical Association updated in 2013.

DATA CONFIDENTIALITY

The authors declare having followed the protocols in use at their working center regarding patients' data publication.

PATIENT CONSENT

Obtained.

COMPETING INTERESTS

FFr received grants or contracts from MSD; received consulting fees from MSD, Sanofi, AstraZeneca and GSK; received payment for lectures from MSD, Sanofi, AstraZeneca, GSK, Gilead and Bial; participated on Data Safety Monitoring Boards or Advisory Boards for MSD, AstraZeneca and GSK.

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