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Trapped Lung and Mononuclear Predominant Exudate with Pleural Cytology Tree Times Negative

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ABSTRACT

Pleural effusions can develop as a result of over fifty different pleuropulmonary or systemic disorders of both benign and malignant etiologies. Consequently, the evaluation of patients with a pleural effusion is challenging since the differential diagnosis is broad. We present a case of a middle-aged woman with a left pleural effusion compatible with mononuclear predominant exudate and ADA level <40 units/L, her medical history includes being a heavy smoker with a history of breast cancer in complete remission, who underwent thoracentesis and pleural fluid analysis on three occasions, cytology being negative every time, she had a trapped lung, thoracoscopic biopsy with no evidence of malignancy, was finally diagnosed with bronchoscopy.

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Introduction

Although pleural effusion has a wide array of etiologies, large series have shown that cancer, heart failure, and parapneumonic infections account for most cases [1]. Cytologic analysis of pleural fluid can establish the diagnosis of Malign Pleural Effusions (MPE) but has an overall sensitivity of approximately 60 percent, which may increase by 15 percent with a second thoracentesis sample [1-3].

The sensitivity of pleural fluid cytology for malignancy varies depending on the histologic type of the underlying cancer, having a sensitivity of 65% for breast cancer [1,2]. Lung entrapment is when lung is unable to expand to the chest wall and achieve visceral and parietal pleural apposition, is a consecuence of active or remote pleural disease [4].

Clinical Case

64-year-old woman with a personal history of breast cancer in 2005 T2N1M0 stage, undergone left radical mastectomy in July 2005, with positive lymph node involvement (2 lymph nodes out of 13), received adjuvant chemotherapy: 4 cycles of FEC (Fluorouracil, Epirubicin, Cyclophosphamide) and 12 cycles of weekly Taxol (Paclitaxel), 27 sessions of radiotherapy until January 2006, and Anastrozole for 5 years, she was followed up until 2019 and is in complete remission to date. Referred to the pulmonology department for moderate left pleural effusion in December 2024 (Figure 1).

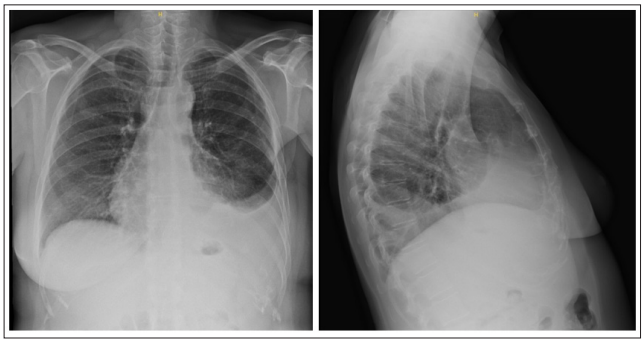

Figure 1: Chest Radiography when the Patient Is Referred to Pneumology

She has been a smoker of a cigar box a day since the age of 15, with an attempt to quit at the age of 25 for seven months with a relapse due to control fantasy. She has a baseline dyspnoea 1 on the mMRC scale and criteria for chronic mucus hypersecretion. She worked as an early childhood educator, cleaner and carer. The patient reportes atypical left chest pain and increased cough of two months' evolution. She denies expectoration, haemoptysis, fever, constitutional syndrome. She also mentiones constipation of a few months of evolution. On examination, oxygen saturation 96%, decreased breath sounds in left inferior and middle fields, no oedema, no laterocervical or axillary lymphadenopathy, neurological examination without focality. Thoracentesis is performed on 5 January 2024 and the fluid is compatible with a mononuclear exudate (96%) ADA negative, pH 7.44, cytology and cultures negative. Total body CT scan performed on 25 January: cranium and neck without lesions, left pleural effusion of abundant quantity, spiculated condensation in the Left Upper Lobe (LUL) of

27x23x62 mm suspicious of neoplasia, no adenopathies, changes of left mastectomy without signs of local recurrence and no axillary adenopathies. Diagnostic bronchoscopy with radioscopy is scheduled on 8 March, previously evacuating thoracocentesis is performed and the patient presents symptomatic hypotension, so the bronchoscopy is postponed. The analysis of the pleural fluid extracted is similar to the previous one, cultures and cytology are again negative. A PET scan is performed on 18 March, which describes numerous findings: pulmonary condensation of the LUL of 27 mm in diameter, it has not grown with respect to previous CT scan and has no increased FDG uptake, left pleural sheets showed increased uptake at the base of the lung, highlighting focal deposits in the medial portion (SUVmax 9.3), in the anterolateral portion between the 7th and 8th ribs (SUVmax 8.1) and in the posteromedial portion between the 10th and 11th ribs (SUVmax 8.8), decrease in the amount of left pleural effusion with respect to the previous CT scan, in relation to previous drainage, showing no significant alterations of the uptake, low right paratracheal adenopathies close to the midline of 1 cm (SUVmax 7.4), left hilar of 0.9cm (SUVmax 7.9) and 0.8cm (SUVmax 7), left interlobar (SUVmax 4.4) and left internal mammary of 0. 6cm (SUVmax 8.3), focus of hyper uptake in the distal oesophagus (SUVmax 9.7), increased uptake of homogeneous and diffuse character of the stomach, increased uptake of the right colon with greater intensity in the cecum (SUVmax 15.6) and another in the hepatic angle (SUVmax 8. 9); in conclusion: increased left pleural uptake, with three foci of increased FDG uptake in the basal portion, of possible neoproliferative character, without being able to rule out inflammatory/infectious aetiology, a biopsy is recommended, mediastinal adenopathies of possible neoproliferative character, without being able to rule out inflammatory/infectious aetiology, focus of hypercaptation in the distal oesophagus and foci of hypercaptation in the caecum and hepatic angle of the colon which appear to be of probable inflammatory/infectious origin, to be completed with complementary tests. Given the PET findings, bronchoscopy with radioscopy is cancelled (the lung lesion in LUL has not grown and does not show increased FDG uptake in PET scan), upper and lower gastrointestinal endoscopy is performed on 8 April, both negative for malignancy, and a pleural biopsy is requested through thoracoscopy, which is performed on 6 June: entry through a 12 mm thoracoscopic port, the findings described are a thickened parietal pleura, a trapped left lung (Figure 2).

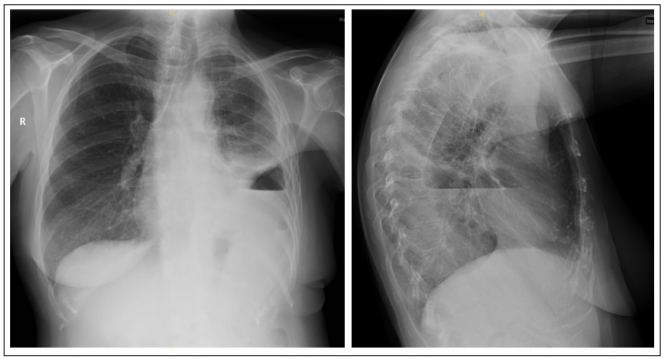

Figure 2: Chest X-Ray with Trapped Left Lung

The biopsy of a 2 cm indurated area of the parietal pleura shows tissue with no evidence of malignancy, with fibrosis and a slight chronic non-specific lymphocytic infiltrate, and a negative pleural fluid cytology. In summary, the patient is a 64-year-old heavy smoker with a history of T2N1M0 stage breast cancer in 2005 who received radical surgery, chemotherapy, radiotherapy and hormone therapy, in complete remission to date, presenting with left pleural effusion compatible with negative ADA mononuclear exudate with 3 negative cytologies, left lung trapped, three pleural implants with SUV uptake around 9 with negative pleural biopsy for malignancy, infracentimetric mediastinal adenopathies with SUV between 4 and 8, lung mass with a maximum diameter of 27 mm in LUL that does not have an increased FDG uptake in PET scan, increased FGD uptake in oesophagus and colon with negative biopsies for malignancy. To complete the study of the trapped lung, bronchoscopy and complete respiratory function tests were requested. Bronchoscopy performed on 13 September describes left bronchial system with moderate decrease in the lumen of its segmental bronchi due to extrinsic compression but with distal lumen and slightly thickened mucosa with pale appearance at the beginning of segmental 6, 8 and apicoposterior bronchus, biopsies for pathological anatomy were taken, being bronchial wall fragments infiltrated by non-small cell carcinoma suggestive of breast cancer. So finally, the patient was diagnosed with metastatic recurrence of breast cancer in lung, pleura and mediastinical adenopathies and was referred to the oncology department.

Discussion

This case is an example of the difficulty in diagnosing the cause of pleural effusion. The pleural fluid cytology was negative three times, and the lung lesion did not show increased uptake in the PET scan and had not grown in two months. The bronchoscopy was postponed because the patient could not tolerate thoracocentesis due to the trapped lung and the pleural samples obtained through thoracoscopy were negative. The trapped lung complicates at least 30 percent of MPE [5]. Among malignant causes of lung entrapment, mesothelioma, primary lung cancer, and breast cancer are most common [6]. In our experience, recurrence of breast cancer must always be ruled out in a patient with this antecedent even though it has been in complete remission for several years.

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