Endobronchial spread in pulmonary adenocarcinoma

A patient with history of asthma presented with general malaise and worsening of wheezing during the night in the former 2 months. Chest radiography was initially ordered, with CT being ordered on follow-up.

**Imaging Findings:**

Figure 1: Chest radiography (front and profile): opacity in the upper lobe of the right lung, apparently respecting the fissure.

Figure 2: CT six weeks after (lung window, sagittal and coronal reformat) - persistent consolidation with slight air bronchogram, and apparent transfissural spread.

Figure 3: Axial CT (lung and soft tissue window), post e.v. contrast. Multiple well-defined nodes (circle) in the same lobe. Consolidation shows homogeneous enhancement and tapered air bronchogram (arrow).

**Discussion:**

Adenocarcinoma is the most common histologic type of lung cancer, and may present with different types of macroscopic presentation, including pneumonia-like consolidation, especially in invasive mucinous adenocarcinoma (formerly mucinous bronchioloalveolar carcinoma). [1]

Air-space consolidation is represented in imaging by homogeneous opacity obscuring vessels, with air bronchogram, preserved lung volume, and fissures.

Classical differential diagnosis for this pattern of long pathology consist of the classical four substances [2]:
- Water (e.g. oedema)
- Blood (e.g. pulmonary haemorrhage)
- Pus (e.g. pneumonia)
- Cells (e.g. adenocarcinoma in-situ, organising pneumonia, etc).

Temporal persistence of lung consolidation despite therapy should prompt suspicion for oncologic pathology.

Despite adenocarcinoma in-situ being the most commonly recalled sub-type of cancer with this presentation, papillary sub-types may also present in such fashion. In some series, this latter type is the most common lung
cancer presenting with consolidation. [2, 3]

Multiple lung nodules were the other significant finding. Differential diagnosis of multiple lung nodules includes metastasis almost universally, and in this case further suspicion should be added by the well-defined contours seen.

The most commonly acknowledged cancer spread pathways are lymphatic, haematogenous, local direct invasion and through the serosal cavities (pleural). In this case, ipsilateral and the same lobe distribution of nodules suggest aerogenous dissemination, which is also a possible cancer spread pathway particularly described for adenocarcinoma. Aerogenous dissemination is also thought to account for possible multircentricity of adenocarcinoma in-situ of the lung. [4]

In this case, bronchioloalveolar lavage was performed with fluid being processed in cell-block technique and immunohistochemistry having been performed. Final diagnosis was consistent with adenocarcinoma of the micropapillary subtype, with immunohistochemistry indicating primary lung origin. Micropapillary predominant adenocarcinoma has tumour cells growing in papillary tufts, which lack fibrovascular cores. [1] This type of tumour has a reported poor prognosis. [1]

The authors believe that this type of lung cancer architecture, with lack of a fibrovascular core, may be associated with aerogenous metastisation.

Important learning points for this case are to consider the possibility of malignancy for persistent lobar changes. In the event of an endobronchial spread pattern being detected, neoplastic disease should not be immediatly discarded, as this has been described as a potentially underrecognised form of lung cancer spread [4, 5].

**Differential Diagnosis List:** Pulmonary adenocarcinoma (papillary subtype), with likely aerogenous metastasis, Lung carcinoma, Lymphoma, Pneumonia (infectious disease)

**Final Diagnosis:** Pulmonary adenocarcinoma (papillary subtype), with likely aerogenous metastasis

**References:**


Travis, William D., Elisabeth Brambilla (2015) WHO Classification of Tumours of the Lung, Pleura, Thymus and Heart. IARC ed

Description: Chest radiography (front and profile): opacity in the upper lobe of the right lung, apparently respecting the fissure. Origin: Serviço de Imagem Médica, CHUC, Coimbra
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**Figure 2**

*a*

Description: CT six weeks after (lung window, coronal reformat) with baseline radiograph for comparison to the left - persistent right upper lobe consolidation with tapered air bronchogram. **Origin:** Serviço Imagem Médica, CHUC, Portugal

*b*

Description: CT six weeks after (lung window, sagittal reformat) with baseline radiograph for comparison to the left - persistent right upper lobe consolidation in the posterior segment, and apparent transfissural spread. **Origin:** Serviço Imagem Médica, CHUC, Portugal
Figure 3

a

Description: Axial CT (lung window). Multiple well-defined nodes (circle) in the same lobe of upper lobe consolidation involving mainly the posterior segment. Origin: Serviço de Imagem Médica, CHUC, Coimbra, Portugal

b

Description: Axial CT (soft tissue window), post e.v. contrast. Consolidation shows homogeneous enhancement and tapered air bronchogram (arrow). Origin: Serviço de Imagem Médica, CHUC, Coimbra, Portugal