Dilated Air Bronchogram Inside Areas of Consolidation: A Tomographic Finding Suggestive of Pulmonary Lymphoma

Broncograma aéreo dilatado en áreas internas de consolidación: un hallazgo tomográfico indicativo de linfoma pulmonar

Dear Editor:

Mucosa-associated lymphoid tissue refers to lymphoid tissue located under the epithelia of the gastrointestinal, respiratory, and urogenital tracts. Mucosa-associated lymphoid tissue located under respiratory tract epithelia is called bronchus-associated lymphoid tissue (BALT). Marginal-zone B-cell lymphoma of BALT is by far the most common form of pulmonary lymphoma (PL), comprising up to 90% of cases.[1–3]

The most common computed tomography (CT) findings of BALT lymphoma are lung nodules and air space consolidation, with or without air bronchogram. Other findings are masses, small nodules, and ground-glass opacities. Pleural effusion and mediastinal or hilar lymphadenopathy are rare findings. In most cases, the disease is bilateral.[1–5] Although the CT findings of PL have been well described, to our knowledge no study has examined the specificity of dilated air bronchogram inside areas of consolidation (DABIC) for the diagnosis of PL.

To assess the value of DABIC as a sign suggestive of the diagnosis of PL, we retrospectively reviewed the CT scans of 188 adult patients who presented with parenchymal consolidation caused by various diseases (e.g., bacterial pneumonia, tuberculosis, fungal infection, organizing pneumonia, eosinophilic pneumonia, lymphoma, adenocarcinoma, pulmonary hemorrhage, pulmonary edema, lipoid pneumonia). The patients were examined in a tertiary hospital in Brazil between 2010 and 2017. Etiological diagnoses of the consolidations were confirmed by clinical, laboratory, and histopathological criteria.

DABIC was present in three of the six patients with confirmed PL (Fig. 1) and in none of the 182 patients with consolidation caused by other diseases. The patients with PL and DABIC were two men and one woman with a median age at diagnosis of 62 years (range, 56–69 years). The diagnosis of BALT lymphoma was confirmed by video-assisted thoracoscopy in two patients and by open-lung biopsy in one patient. Four patients were asymptomatic on initial diagnosis, and the pulmonary lesions were discovered by routine radiography. Two patients presented with nonspecific pulmonary symptoms, such as cough, dyspnea, thoracic pain, and hemoptysis.

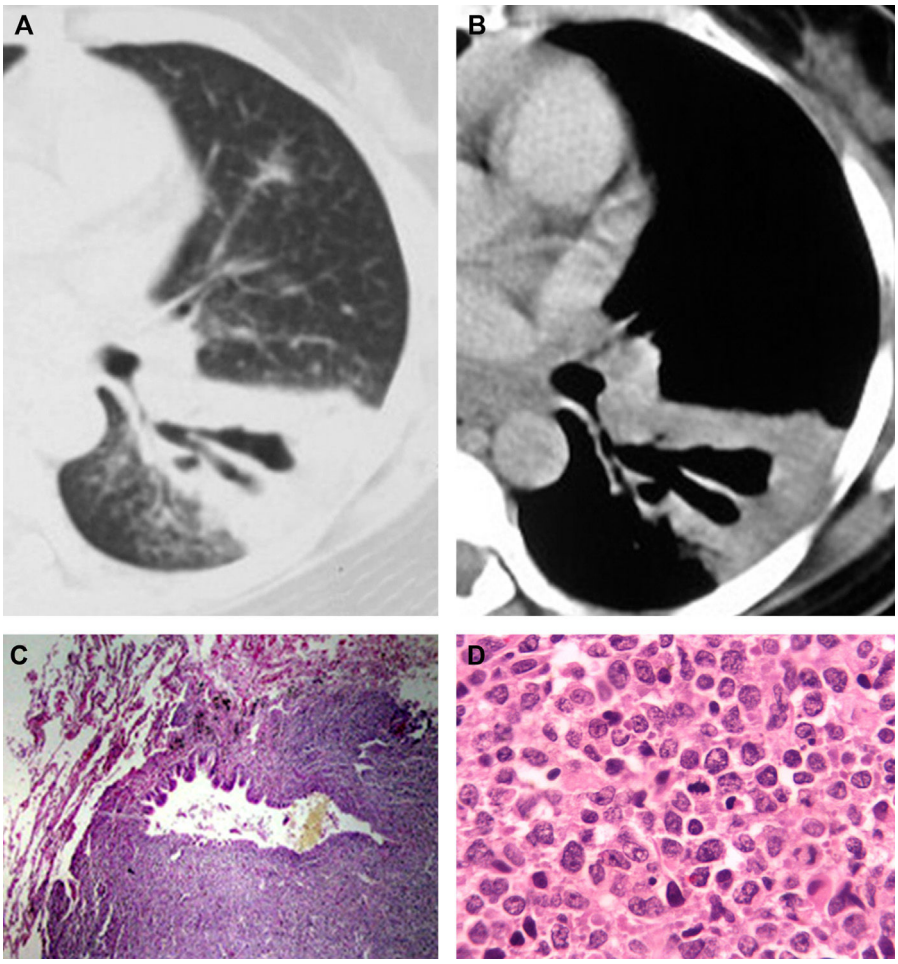

Fig. 1. A 45-year-old woman with biopsy-proven BALT lymphoma. Axial computed tomography with the lung (A) and mediastinal (B) window settings showing an area of consolidation in the left lower lobe containing a markedly dilated bronchus. In (C), histopathological section demonstrating a dilated bronchiole with peribronchiolar infiltration of neoplastic cells (hematoxylin and eosin stain, magnification 40×). In (D), histological section showing proliferation of lymphoid cells (hematoxylin and eosin stain, magnification 400×).

Definitive diagnosis of BALT lymphoma requires tissue sampling with immunohistochemical studies to confirm a monoclonal B-cell population.[1,2] Wislez et al.[3] studied CT findings from 13 patients with BALT lymphoma. They observed consolidations with air bronchograms in six patients. The air bronchograms seemed to be dilated in three cases. CT abnormalities correlated with gross pathological appearance and were related to lymphomatous infiltration with a peribronchovascular distribution. Pathological examination confirmed the presence of airway dilation within lymphomatous lesions. The authors observed no destruction of the bronchial wall or tumor necrosis. They also reported that there are many differences between the bronchial dilation seen in BALT lymphoma and that observed in bronchiectasis. In BALT lymphoma, the bronchial wall is not destroyed, and the dilation is reversible after the lymphoma has been treated. Lymphoma-associated bronchial dilation is always surrounded by a consolidation or mass (generally absent on CT in bronchiectasis) and is not accompanied by sputum. On the other hand, bronchial dilation associated with bronchiectasis is irreversible due to bronchial wall destruction and is frequently associated with productive cough. The authors suggested that bronchial dilation in BALT lymphoma results from the collapse and destruction of the peribronchial parenchyma secondary to lymphomatous proliferation.[3] Other authors have also reported air bronchograms with bronchial dilation in patients with BALT lymphoma.[4,5] In conclusion, the presence of DABIC appears to be a sufficiently specific CT finding to suggest the diagnosis of PL.

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Edson Marchiori,[a,*] Bruno Hochhegger,[b] Gláucia Zanetti[a]

[a] *Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil*
[b] *Universidade Federal de Ciências da Saúde de Porto Alegre, Porto Alegre, RS, Brazil*

* Corresponding author.
E-mail address: edmarchiori@gmail.com (E. Marchiori).

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Invasive Mucinous Adenocarcinoma in Congenital Pulmonary Airway Malformation: A Case Report☆

Adenocarcinoma mucinoso invasivo sobre malformación congénita de la vía aérea pulmonar (MCVAP): a propósito de un caso

To the Editor,

We report the case of a 29-year-old woman, former smoker, with congenital pulmonary airway malformation (CPAM) diagnosed previously using chest computed tomography (CT) (Fig. 1A). The malformation consisted of anomalous arterial vascularization (Fig. 1B), giving rise to a hybrid lesion: CPAM+pulmonary sequestration.

Three and a half years later, the patient presented in the emergency department due to fever, cough, and pain in the left hemithorax. Chest radiograph was performed (Fig. 1C), which revealed consolidation in the left lower lobe, which in the clinical context of the patient was suggestive of pneumonia. Given her persistent pain and dry cough after antibiotic treatment, we decided to expand the study with a chest CT (Fig. 1D), which showed consolidation within the CPAM. The differential diagnosis of this consolidation was determined to be either a bacterial superinfection of the CPAM or a neoproliferative process. Bacterial superinfection was the most probable diagnosis given the visualization of consolidation, accompanied by a concomitant predisposing lesion. A neoproliferative process, on the other hand, was less likely, taking into account the uncommon pattern of presentation and the young age of the patient. Due to the suspicion of superinfection and the high probability of recurrence, we decided to perform lower left lobectomy. The surgical specimen was sent for pathology study (Fig. 1E and F), which gave a definitive diagnosis of invasive mucinous adenocarcinoma in CPAM, with a pseudopneumonic pattern.

CPAMs form a heterogeneous group of cystic lesions and non-cystic lesions caused by early changes in the development of the pulmonary airway. The estimated incidence is 1/25 000–35 000 newborns.[1] There are 5 subtypes, Type I being the most frequent and the one associated with the largest cysts.[2] Most are supplied by blood from the pulmonary circulation, with the exception of hybrid lesions that may receive blood directly from the systemic arterial circulation.[3]

Malignant transformation has been reported in some cases of type I CPAM, a situation that is associated with a mutation in the K-*ras* gene. In 2013, Ishida et al. published a case report with a review of the literature,[4] in which the authors described the fourth documented case to date of this type of CPAM-associated neoplasm with K-*ras* mutation. The case we describe also had the K-*ras* mutation. Radiological management is complex, since the similarity of this entity and bacterial pneumonia on imaging studies may delay diagnosis.[5] Pseudopneumonic pattern of the tumor is associated with a worse prognosis, while treatment of choice is surgical resection.

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